THE IRON AGE

THURSDAY, NOVEMBER 27, 1902.

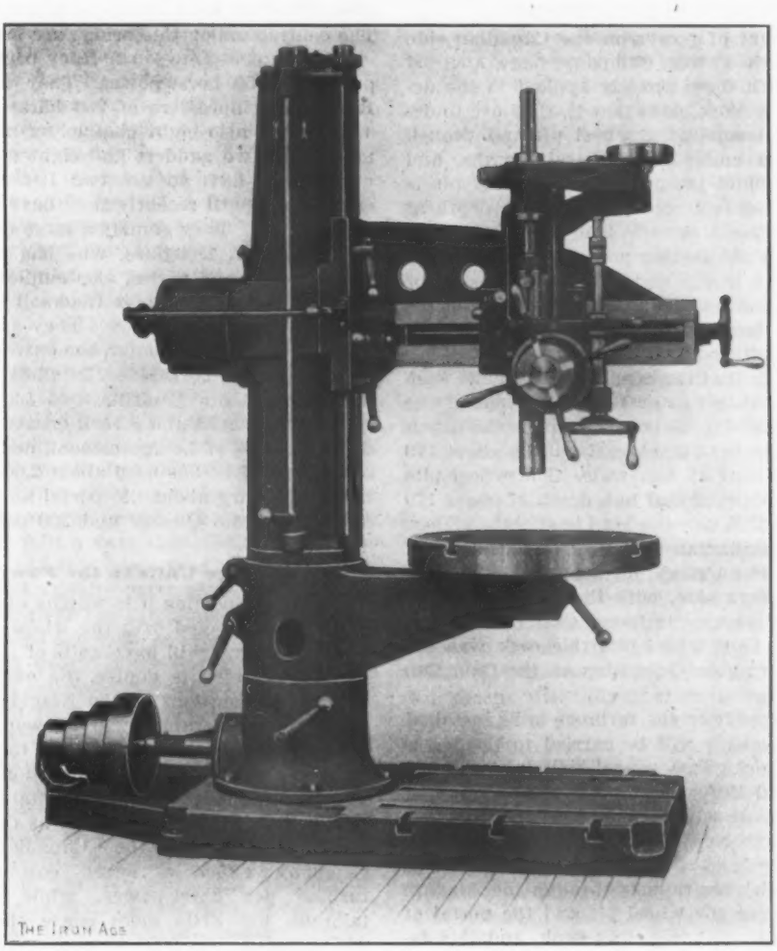
American Processes in India.

Announcement comes simultaneously from Pittsburgh and London that James N. Tata, the wealthy manufacturer and merchant of Bombay, who recently traveled over a large part of this country to investigate coking and iron and steel making processes, has arranged to proceed with an iron and steel development in the Chanda district, Central Provinces of India, which will involve an expenditure of upward of $12,000,000. Julian Kennedy of Pittsburgh is acting as consulting engineer for the enterprise, and M. Heim, once with the Carnegie Steel Company, will sail for India for the purpose of taking up the preliminary work.

The London cablegram states that a contract has been made with the Universal Fuel Company of Chicago, of which Joseph Leiter is vice-president and general manager, to use their process of coking, which has proved successful in making coke from coal previously classed as non-coking. The Indian coal is of a quality requiring the use of a process of this character. It is altogether probable that the construction of iron and steel works will depend on the degree of success attained in the coking of the coal, which will be first attempted. The projected works will consist of three large blast furnaces and a steel plant, making rails as a part of the product. The deposits of iron ore and coal owned by Mr. Tata are so extensive that if the initial plant shows satisfactory results a great industry will develop.

The New Dreses Radial Drill.

In the new radial drill built by the Dreses Machine Tool Company of Cincinnati the lever protruding through the arm near the column starts, stops, reverses the spindle quickly for tapping, and also engages the back gears according to the three positions: central, right or left. The little knurled head screw passing through this lever limits the brake power of the forward driving clutch, and can be so adjusted that it just drives the tap, but slips if the hole is too small for the tap or when the latter strikes the bottom of the hole or any other obstruction. The auxiliary lever serves for setting the machine for tapping, all while running, and can also be used for tapping direct when it is desired (for small tapping) to run forward at a high speed and back out at an only slightly increased velocity. The two levers operate four friction clutches in connection with the gearing and the two horizontal driving shafts. The spindle is provided with a depth gauge and an automatic stop. Any one of the four quick return levers disengages the feed and operates the spindle, all in one movement and without using both hands. There are four changes of feed, which can be varied by shifting the knob on the feed rod while drilling.



THE NEW DRESES RADIAL DRILL.

The H. K. Porter Company of Pittsburgh, builders of light locomotives, have received a contract for a number of locomotives for shipment to Japan.

Canadian Niagara Power Plants.

It is highly probable that there is no other point in the Dominion of Canada, possibly not in the British Empire, where there is such marked industrial activity as on the Canadian side at Niagara Falls, where two companies are hurrying their work in the development of a portion of the power of the famous Horseshoe Fall, in order that a generous supply of electric current may be placed on the market for the operation of industrial establishments and for transmission to distant places. The companies creating the development are the Canadian Niagara Power Company and the Ontario Power Company. The Canadian Niagara Power Company are practically the same company that have already developed power by means of a tunnel and wheel pits on the New York side, while the Ontario Power Company have John J. Albright of Buffalo for their president, and are making a development which the company expect will be second to none in the Niagara region.

Canadian Niagara Power Company.

For the development of power on the Canadian side the Canadian Niagara Power Company have adopted methods identical with those already applied to the development on the New York side—that is, they are to develop the power by means of a wheel pit and tunnel. Their work has been under way several months, and they have made splendid progress. The wheel pit is down to a depth of 106 feet, and progresses in depth at the rate of about 12 feet a month. The plans call for a pit 480 feet long, but the section now in course of construction is 266 feet in length and will provide room for five turbines and connected installation, affording a development of 50,000 horse-power, the final development from the pit when fully completed to be 100,000 horsepower. But it is likely that the company will make even a larger development than this on the British side of the river, that is so bountiful in its power supply. The depth to which the wheel pit is to be carried will be about 170 feet, and it will be about 21 feet wide. The wheel pits on the New York side are carried to a depth of about 179 feet, but on the Canadian side the land is slightly higher. In sinking this first Canadian wheel pit it is worthy of note that much the same conditions of rock have been met as on the New York side, with the exception, however, that the blue limestone is found near the surface. In sinking the New York wheel pits this rock was not found, but it crops out near Queenston on the Canadian side 5 miles or so below.

The water discharged from the turbines to be installed in the Canadian wheel pit will be carried to the lower river through a tunnel. This tunnel will be 2200 feet long, 25 feet high and 18 feet wide at the spring line inside the lining. Thus it will be 4 feet greater in hight than the tunnel on the New York side. The contractor on the tunnel is Anthony C. Douglass, who has had much experience in driving tunnels through the Niagara rock. Midway between the wheel pit and the portal of the tunnel a shaft, 10 x 16 feet, was sunk, and this facilitated the tunnel construction. The work of removing the lower bench of the tunnel is now in progress, and it has been taken out for a distance of about 1000 feet. The tunnel at Niagara Falls, N. Y., is lined with brick throughout, but, owing to the prevailing brick famine, the Canadian Niagara Power Company will dispense with brick to a considerable extent, and from the spring line down the Canadian tunnel will be lined with concrete, the facing, however, to be of vitrified brick. This application of concrete to this portion of the work will save using about 3,000,000 brick. The arch of the tunnel will require at least 1,250,000 brick, 200,000 of which are already in hand.

Method of Taking the Water Supply.

It will be recalled by those familiar with the conditions of the development on the New York side that the water supply is taken from the upper river through an inlet canal. On the Canadian side a vast forebay will be constructed, the contract for which is in the hands of Dawson & Riley of St. Catharines, Ontario, the same firm having the contract for sinking the Canadian wheel pit. This forebay will have a length equal to that of the wheel pit, and after spreading out in front of the pit it will narrow down to 250 feet at the point where it will be crossed by the tracks of the Niagara Falls Park & River Railroad, when it flares out again to a width of about 400 feet. The walls will be of stone brought from the vicinity of Montreal. The forebay will carry an average depth of 18 feet of water. From a point near the north end of the wheel pit a canal 16 feet wide and running northeast for a distance of about 500 feet will be constructed as an ice run, the difference of level between the entrance and the mouth of the canal to be 4 or 5 feet, so that a good current will be created through it. It will discharge into the river below the forebay, and gates will be erected near the wheel pit end to regulate the flow.

The tracks of the Niagara Falls Park & River Railway will cross this forebay, or what may be termed the canal like portion of it, on a magnificent stone bridge composed of five arches, each about 50 feet long and 60 feet wide. The bridge will also be provided with a boulevard driveway, and when finished is expected to be the finest piece of stone arch bridge construction in the country. The contractors on this bridge are Mumford & Lowery.

The plant of Dawson & Riley begins with a boiler capacity of 750 horse-power. They have two compound Rand air compressors of 250 horse-power each, Corliss valve type; also eight channeling machines of Sullivan make, and two gadders and eight drills of the Ingersoll type. They have in use two 10-ton Brown locomotive cranes, but until recently they have been using derricks on the work. They employ a large number of hands.

Anthony C. Douglass, who has the contract for the tunnel, shaft and portal, also employs many hands. He has two compound duplex Ingersoll air compressors, each of 125 horse-power, in use. They are operated by a 400 horse-power electric motor, the current being transmitted from the New York side. In addition to this his plant consists of about 12 drills, two Lidgerwood hoists, one Otis elevator hoist and a rock crusher. He will use about 20,000 barrels of Lehigh cement, and in the timber work of the tunnel he has used about 2,000,000 feet of timber. In the masonry about the portal he will use 60 carloads of granite from Quebec and 200 carloads of Queenston limestone.

Large Units in the Power House.

In this connection it is worthy of note that the power house to be erected over the wheel pit on the Canadian side of the river will have units of 10,000 horse-power, or 7500 kw., which is double the output capacity of the units in the stations of the Niagara Falls Power Company. The generators will be wound for 12,000 volts, three phase, but in order that the machines may be paralleled with those in the stations on the New York side the frequency will be maintained at 25 cycles. In establishing 10,000 horse-power as the unit for the Canadian development the Canadian Niagara Power Company effect a lower cost of generator and turbine per horse-power, while the machines will take up but little more space than a machine that will generate but 5000 horse-power. The generators to be installed will be of the internal revolving field type with vertical shaft. They will make 250 revolutions per minute. The diameter of the generators will be about 19 feet, while 141,000 pounds will be the weight of the revolving part of the machine.

In the agreement between the Canadian Niagara Power Company and the commissioners of Victoria Free Park it is provided that the developed power is to be transmitted beyond the park boundaries for use in manufacturing plants or otherwise, and for this reason it is believed that the voltage of 12,000 will result in economy for this transmission and distribution to consumers. While it is contemplated to supply Toronto, Ontario, with electric power from this great installation, the voltage of the power to be sent there will be raised to something like 60,000 volts, it is understood. Under the controlling agreement the Canadian Niagara Power Company must have contracted to expend or actually expended by July 1, 1903, the sum of $1,500,000 in works, plant and material in connection with the project, while by July 1, 1904, they are to have water connections for the development of 50,000 horse-power, and to have 20,000

horse-power actually ready for use, transmission and supply.

Ontario Power Company.

The plan of this company contemplates a development of power on the Canadian side very similar to that employed by the Niagara Falls Hydraulic Power & Mfg. Company on the New York side. However, so far as their plans have been made clear, it appears that the supply of water for the wheels will be conducted through one or more pipes of large size, possibly about 18 feet in diameter. This water supply will, it is indicated, be taken from a forebay structure created in the vicinity of Dufferin Islands, the pipes running through Victoria Free Park to a point on the high bank in the vicinity of the power station. These pipes will be either of wood or steel, and will be placed underground, so as not to mar the scenic beauty of the park. It is understood that a series of penstocks will extend from them down the bank to the station and the wheels to be there installed.

The excavation for the site of the power house is being pushed as fast as possible, the hope being that the company will be able to clear the *débris* slope of the bank away before cold weather sets in. This site is not far distant from the Horseshoe Fall, and it is almost continually under the influence of the spray cloud of the cataract. For this reason it is evident that unless the winter is a very open one it will be impossible to do much on the site during the cold season, when it may be expected that vast quantities of ice will form on the site and in its vicinity. The dimensions of this station are not as yet announced. It is probable that the winter will be employed in driving tunnels through the cliff to the point of the large pipe feeders above mentioned.

In preparing for their development the Ontario Power Company have wrought a truly marvelous condition of affairs in the vicinity of the beautiful Dufferin Islands, and there is now visible there a scene which human eyes have never before witnessed. Starting from the mainland they have built a dam about 782 feet out into and down the river, and this has served to divert all the water from the island vicinity out into the deeper main channels, leaving the river bed for a vast area high and dry. It is a remarkable spectacle so created, and it may be judged that many people made anxious search over the dry rocks, in the pot holes, depressions and crevices for things that might form relics of this strange condition of affairs. It is found through this work that the river bed is of solid rock of strange formation, the rapids-creating ledges all being bared to the eye. It is thus clear where the upper Niagara obtains its pretty little falls as the waters of the great lakes rush in such mighty torrent toward the world famed brink.

The construction of this big cofferdam was accomplished by Barry & Co., and it is looked upon as one of the best pieces of work of the kind done at Niagara. It runs through water having a depth of from 6 to 7 feet, while outside of it the current sweeps along at a 12-mile per hour pace. During the winter the Ontario Power Company will push the work at every possible point, and it is expected that with the opening of next spring there will be truly wonderful activity in the progress of developing the power of Niagara on the Canadian side by both of the companies having franchises there.

A Chicago Engineers' Club.—A new club, to be called the Engineers' Club, was formed in Chicago on November 17, the object of which is purely social. According to the *Railroad Gazette* the club will have no constitution, by-laws or regular dues, the financial requirements being provided for by a small initiation fee and an occasional assessment. The club will be primarily a luncheon club and suitable quarters are to be secured for the purpose of meeting daily at the luncheon hour. The charter members are Andrews Allen, B. J. Arnold, Onward Bates, T. L. Condron, H. N. Elmer, W. N. Finley, H. M. Herr, H. E. Horton, C. W. Hotchkiss, W. M. Hughes, R. W. Hunt, C. F. Loweth, C. W. Melcher, Ralph Modjeski, H. W. Parkhurst, A. V. Powell, Isham Randolph, Louis E. Ritter, G. H. Scribner, E. C. Shankland, T. W. Snow, J. F. Wallace and August Ziesing. Mr. Modjeski was made chairman of the temporary organization and Messrs. Bates, Modjeski and Ritter were made a committee on permanent organization.

Imperial Works of Oil Well Supply Company.

The Oil Well Supply Company have nearly completed the building of a large plant at Oil City, Pa., known as the Imperial Works. The new plant is located about 1 mile from the center of the city, on an electric railway line. The plot of ground comprises nearly 45 acres, of which about 25 acres will be devoted to manufacturing purposes and the remainder used as sites for dwelling houses for the employees. The property is located on the Allegheny River and on the lines of the Pennsylvania, Lake Shore and Michigan Southern and Erie Railroad systems. Twenty buildings, covering a distance of about 1500 feet along the railroad and river, have already been occupied. A vacant space of 600 feet in length at each end of the property has been reserved for future use.

The manufacturing buildings are one story high, constructed of steel and brick, with slate roofs. The sizes of the buildings and the purposes for which they are designed are as follows: Office, two-story and basement stone building, 50 x 75 feet; building for steam and gas engines, 150 x 200 feet; general machine shop, 150 x 200 feet; pattern and carpenter shop, 50 x 130 feet; blacksmith shop, 75 x 150 feet; pattern storage, 75 x 150 feet; drop forge shop, 75 x 150 feet; tapping malleable iron fittings, 50 x 150 feet; iron sucker rods, 75 x 150 feet; annealing malleable iron fittings, &c., 50 x 150 feet; sucker rod joints, 75 x 150 feet; malleable iron foundry, 75 x 150 feet; foundry storage, 50 x 150 feet; storage and shipping, 75 x 150 feet; storage shed, 50 x 100 feet; gray iron foundry, 125 x 300 feet; foundry storage, 50 x 150 feet; power plant, 75 x 100 feet, and gas regulating station.

Nearly all of these buildings have direct connection by switch with the lines of railroad above named. There is also a comprehensive system of narrow gauge tracks, 20 inches wide, outside and inside of each building. Overhead pneumatic and electric cranes are placed in every building requiring such service. The power house is located in the center of the property, on the bank of the river. There are six 250 horse-power Tonkin patent internally fired water tube boilers. The stack connected to them is of steel, self supporting, 175 feet high. There are four 350 horse-power tandem compound condensing engines and four 200-kw. direct current dynamos of 250 volts potential. Steam, electricity, hydraulic pressure and compressed air are used for power. The machinery is operated by electric motors. The buildings are heated by the fan system, cold air being passed over pipes heated by exhaust steam from the engines and the heated air blown into the buildings.

Natural gas is used under the boilers and in the heating furnaces, the company having their own pipe line, more than 10 miles in length, and several thousand acres of gas territory. Provision is made for burning coal if required. A water plant with two 60,000-gallon high duty pumps, located in the power house, provides water for the works and dwelling houses on the company's property; also for other buildings, and fire protection for that end of the city.

The plant is laid out with a view to enlarging each building if so desired. The gray iron foundry is now 300 feet in length and it can readily be extended to 1000 feet or more. Every other building can be lengthened from 100 to 200 feet. This is the largest individual plant owned by the Oil Well Supply Company and is expected to be in full operation shortly after the first of the year.

The Hockensmith Wheel & Mine Car Company, with works at Irwin, Pa., will build a new plant at Penn, Pa., about 3 miles east of Irwin. The new plant will cover about 35,000 square feet and the buildings will be of steel and brick. The company have been congested with orders for wheels and modern cars and find it necessary to greatly increase their capacity. The present capital stock is $100,000, but this will be materially increased.

The Proposed New York Electrical Laboratory.

At the last session of the Legislature of New York State a commission was appointed to consider the question of the advisability of the State establishing an electrical laboratory. This commission consists of State Engineer Edward A. Bond, Charles P. Steinmetz of the General Electric Company, and H. W. Buck, electrical director of the Niagara Falls Power Company. The commission has held several sessions since it was formed, and on November 13 it held one of its final sessions at Niagara Falls. It is understood that the commission will report in favor of the establishment of a laboratory by the State, also in favor of a standardization bureau. Among other interesting facts brought out by the commission is that the capitalization of the companies in New York State involving the use of electricity amounts to $1,462,615,595, while the capitalization of companies engaged in the manufacture of electrical apparatus is $217,974,695, making a total of the capital interested $1,680,590,290. In these figures is represented the capital interested in the use of electricity in the Empire State alone.

Considering the manner in which electricity is growing in popular use and application throughout the world it is no wonder that other States and countries will watch with a vast amount of interest these important steps about to be taken by New York State, a State that is the happy possessor of the greatest electric power development and source of supply. The location of the proposed electrical laboratory will no doubt be a question for future decision, but Niagara Falls is quite hopeful that it will be located there. In fact the claim is advanced that there is every reason why it should be located at Niagara, where a large amount of power, at any voltage, would always be on tap for experimental purposes. For this reason, and considering the object of the proposed laboratory, it would appear that no other place could be a rival of Niagara.

It is understood that should the laboratory be established, it would act as arbitrator in disputes over electrical matters, while it would serve as a standardization bureau, the benefits of which would be manifold to all parts of the State. Every city and town and every individual consumer of electric light would be in place to be benefited. The inaccuracy of meters on the quantity of current supplied to individuals would come up for treatment and remedy. Owing to a lack of standardization many cities get good bargains in their public lights and others get very bad bargains. When a standard is adopted by the State authorities all would fare alike and there would be an improvement of the illumination in many places.

There would be no end of work for the laboratory officials. To-day there are many disputes arising from mutual induction, especially between circuits carrying large currents and the circuits used for the transmission of intelligence, notably the telegraph and telephone lines. Another point is the crossing of circuits and failures of insulation, resulting in accidents to life. The subject of electrolysis has long been a question of consideration in many municipalities, and in all of these places the electrolysis of underground pipes is a feature of alarm. In the systems of insulation and installation the insurance companies in all sections are vitally interested.

Then the new department would have the settlement of all disputes between manufacturers and buyers as to the efficiency of apparatus, and in this way a high standard would be established. The question of transmitting power at high voltages through thickly populated sections would no doubt have consideration, especially when the transmission is made by pole lines. The transmission of voltage on overhead lines often causes trouble between the electrical companies and municipalities. It is also probable that the laboratory would have to do with disputes between manufacturers of electrochemical products and the general public, especially where and when poisonous gases or noxious gases are liberated during the process of manufacture, damaging surrounding property and causing much injury to the general health of a locality. As Niagara Falls advances as an electrochemical center such a laboratory would be a great benefit to it.

Under the conditions of to-day large sums of money are expended in the adjustment of disputes that might easily and satisfactorily be settled by laboratory officials, removing a heavy burden from both sides of a contest. In case a standardization bureau were established the official authority from it would supersede the expert witnesses.

At present, strange to say, the electrical standards come largely from Germany, and these are not always adaptable to the conditions in the United States. One of the important features of the proposed laboratory would be to have several thousand horse-power always available, as stated, and phenomena could be observed as well as valuable experiments made. As the equipment of the laboratory would be thoroughly complete, it might be expected that the standard reached would be as high as any in the world.

Considering the industrial prominence of New York State, the action of the next Legislature on this question will be awaited with much general interest, while it may be expected that the complete report of the commission above mentioned will have much in it of interest to the electrical industry.

The Indiana Iron Ore Deposits.

Sensational reports have appeared in the daily press concerning recent discoveries of iron ore in Sullivan, Greene and other counties of Southern Indiana. They were based on alleged investigations by Alabama ore experts engaged by the promoters of the Indianapolis Southern Railroad, which will traverse the territory in which the rumored rich beds of ore lie. The reported assay made by them was stated to be 60 to 70 per cent. metallic iron and the value of the deposits at $100,000,000. Some of the daily papers put the amount at $100,000,000,000. The projectors of the road deny responsibility for the reports, including alleged interviews with themselves, and say the announcements in the newspapers were the first they had heard of the so-called discoveries.

W. S. Blatchley, Indiana's State Geologist, says he has learned of nothing new as to the iron deposits. There were blast furnaces reducing the ores of the State as long ago as 1840. There have been, he says, 18 or 19 furnaces all told using these ores, the last of which, at Brazil, went out of operation about 1893. A furnace at Terre Haute continued to use the better ores from other States until 1896. The ores of the State are limonite, brown hematite, siderite and pyrites, the bog iron being found in largest quantities in Greene, Martin, Monroe and Perry counties and in the swamps of Lake, Porter and St. Joseph counties. It is too siliceous to compete with the richer hematites of Lake Superior, Missouri, Tennessee and Georgia. There are in Greene County veins, 5 to 8 feet thick, of a mixture of limonite and brown hematite, covering an area of 1500 acres. The analysis of this shows 55.09 per cent. metallic iron, 0.60 phosphorus and 11.66 free silica. Block coal of good quality is found near the iron ore. Mr. Blatchley says that pyrites, or "fools' gold," is the most widely distributed iron ore in the State, being found in greater or less quantities in every county. It has 46.7 per cent. of iron and 53.3 per cent. of sulphur. It occurs most abundantly associated with the thickest veins of bituminous coal mined in the State.

The Louisville & Nashville Railroad Company have issued a new freight tariff sheet, advances taking effect November 22, and reductions November 15. The new rate on pig iron, per ton of 2268 pounds, from the Birmingham group to Beloit, Wis., is $4.40; Chester, Ill., $4.15; Granite City, Ill., $3.75; Menard, Ill., $4.15; Monmouth, Ill., $4.15; Mt. Vernon, Ill., $3.75; Murphysboro, Ill., $3.75; New Athens, Ill., $3.75; Venice, Ill., $3.75; Janesville, Wis., $4.40, and Lincoln, Neb., $5.56. The usual differentials apply from other Southern points.

Boiler Explosion at the City Pumping Station, Astoria.

BY A. OSGYANI, NEW YORK.

No article, however profusely supported by chemical analyses proving the dangerous character of some kinds of water, could be so convincing as a boiler explosion which is the natural consequence of using such water for a long period in its original state of impurity. In my article published in the issue of *The Iron Age* for November 6 I described the character of the water obtained from a city pumping station which the New York Steel & Wire Company had been obliged to use in their works at Astoria, on Long Island. In that article an analysis was given of the water when conditions were favorable. The impurities amounted to about 50 grains per gallon, due to the fact that the supplies from several public pumping stations when mixed resulted in a far better quality of water than would have been the case had this particular pumping station, which no longer exists, supplied the water alone. The plant under consideration blew up on November 9. It was a portion of the general water equipment of the Water Department of the City of Greater New York.

Fig. 1.—*Location of the Power House.*

Fig 2.—*The Uninjured Boiler.*

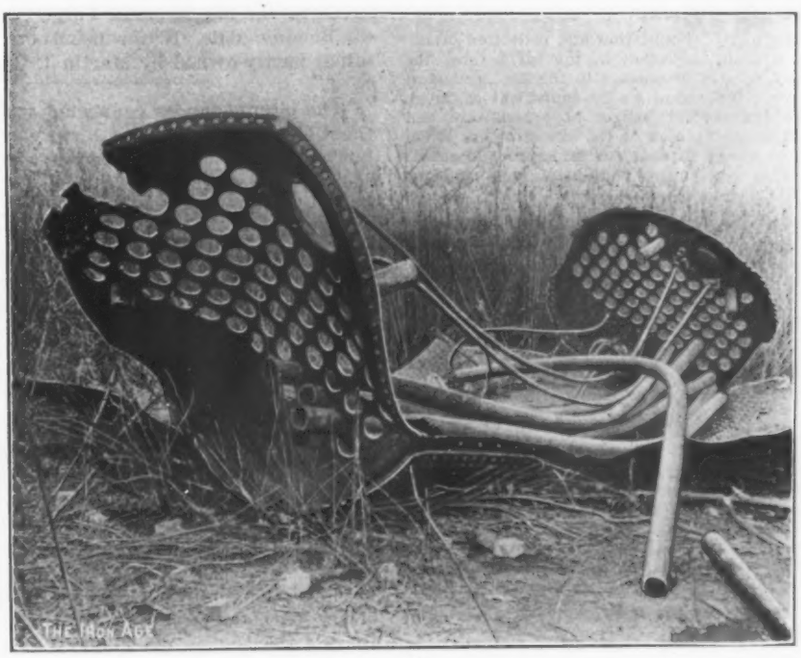


Fig. 3.—*The Boiler Which Exploded.*

BOILER EXPLOSION AT THE CITY PUMPING STATION, ASTORIA, N. Y.

This plant, which was the cause of expenditures running up to thousands of dollars by manufacturers in its vicinity, consisted of two 125 horse-power horizontal tubular boilers, each 6 feet in diameter and 18 feet long, having shells ⅜ inch thick. They were inclosed in a brick building 50 x 50 feet, with a maximum hight of 30 feet, containing also the usual pumps. The water was used without any attempt at purifying it, except that some boiler compound had been added which did not seem to have worked to great perfection, as it was found necessary, I understand, frequently to clean out the scale deposit on the boiler shell and tubes. Of the arrangements used in order to accomplish this I have been unable to ascertain anything. The fact is that the exploded boiler plainly shows heavy scaling in places, and where at present there is no scale the injuries caused to the steel by previous incrustations are still more evident.

The boiler which blew up, killing the engineer and fireman, caused the destruction common in such accidents. It totally demolished the brick building sheltering it, hurling the bricks a distance of over 1000 feet and lifting up the second boiler from its foundations and depositing it 100 feet away. The boiler which exploded was thrown a distance of some 200 feet. Its shell has been opened lengthwise, exposing the thickness of metal. At one place this was reduced to 1-32 inch from the original ⅜ inch, and it is likely that this was the starting point for the explosion, it being the weakest spot on the line. In many places the thickness was found to be only 1-16 inch.

It was a well-known fact for years that the water obtained at this station was not only unfit for boiler use

but also dangerous from a sanitary point of view. At one time it was entirely abandoned on these grounds, but was opened up again when changes in the administration of the city's affairs took place. Deplorable as the accident is, owing to the loss of life, manufacturers in the neighborhood are to be congratulated on the obliteration of this plant, which while it existed was a public nuisance.

The accompanying illustrations were taken shortly after the explosion and show the destructive force of the high pressure of the steam. Fig. 1 shows the location of the power house. In the foreground is the foundation. In the background, in the middle of the picture, the uninjured boiler which was carried away from its setting can be seen with the tube sheet partly covered by a section of the chimney. In Fig. 2 this boiler is more plainly shown. Fig. 3 is a picture of the boiler which exploded and which lies about 140 feet from the first boiler.

Notes from Mexico.

Exchange and Import Duties.

DURANGO, November 12, 1902.—The fluctuations in the value of the Mexican dollar has caused not alone inconvenience to the importers, but also to the Mexican Government in the collection of duties upon goods brought into the country. To mitigate the trouble incidental to these fluctuations, without disturbing the existing tariff schedules, the Department of Finance has just introduced a bill into Congress asking that the Executive be empowered as follows:

To establish a basis for the liquidation and collection of import duties, so that without variation in the tariff rates the yield of the duties may vary in proportion to the fluctuations of foreign exchange above 120 per cent. or its equivalent of 22½d. per peso, adopted in the current budget of expenditure and within the limits that in the opinion of the executive are indispensable to meet the excess of expense for exchange and remittance of funds incidental to payments that have to be made by the nation in foreign money.

Authority is also requested "To repeal the stamp tax of 7 per cent. on import duties and 2 per cent. of port dues authorized by the laws of May 12, 1896, and November 30, 1898."

The active operations in prospecting and drilling for petroleum, and the increasing use of the crude product for fuel purposes have caused the Minister of Finance to consider this article as a legitimate one for taxation. A clause of the same bill asks for power as follows:

To establish an interior tax upon crude petroleum intended for refining purposes or upon refined petroleum, provided that, in reducing the tariff duty on said article in order to facilitate its importation on a large scale for fuel purposes the executive should consider necessary to avail itself of that means in order not to curtail the amount of the duties which the treasury at present receives for petroleum intended for refining.

The Monterey Steel Plant.

Word comes from Monterey that good progress is being made in the construction and equipment of the works of the Monterey Iron & Steel Company. It is now thought that everything will be ready to make a start early in the new year. The management and shareholders generally are sanguine that the works will prove to be a profitable undertaking from the beginning. One of the active promoters of the industry who was recently interviewed in Mexico City made the avowal that the company "will enter into competition with the whole world in the production of steel rails and steel beams for building," and that they "will be able to turn out a finished article equal to any the world produces, and at a lower cost." Granting that these professions can be made good, the success of the new venture seems assured.

Railway Purchase.

Mexico's greatest railway system, the Mexican Central, have added to their mileage, already extensive, by the acquisition of the Cuernavaca & Pacific Line, which runs from Mexico City to the old home of Cortez Cuernavaca. The terms of the transfer are said to be the payment by the Mexican Central of the liabilities of the Cuernavaca & Pacific, between $4,000,000 and $5,000,000, Mexican silver. The track of the latter will be extended to the Pacific Coast, probably to Acapulco. J. J. D.

Joseph T. Ryerson & Son's Sixtieth Birthday.

The sixtieth birthday of Joseph T. Ryerson & Son of Chicago is commemorated by a special anniversary issue of *Ryerson's Monthly Journal and Stock List.* Advantage is taken of this opportunity to present a number of exceedingly interesting features. Among these are some historical points which are well worthy of attention. The name of Ryerson, it is stated, has been associated with the iron and steel business in America since its inception. The records of the family go to show that one George Ryerson in 1695, together with two or three other men of that time, purchased from the Indians 6000 acres of land in Northern New Jersey, which they developed for its agricultural and mineral resources. His son, Martin, pushed the development of the iron interests to the extent of manufacturing pig iron as early as 1740. His son, Thomas, started in business as a wholesale dealer in finished iron and steel products in Philadelphia in 1790. His son, Joseph T., removed to Chicago and established the present firm of Joseph T. Ryerson & Son in 1842. His son, Edward L., continued the business, which since the year 1888 has been a corporation of which he has been president. His son, Joseph T., enters the employment of the firm on the sixtieth anniversary of their formation, thus making the sixth generation in the line of descent associated with interests of this character. Illustrations are given of the old Ryerson Forge established about 1815 at Bloomingdale, N. J., using ore which came from mines partly owned by Martin J. Ryerson, at Ringwood, N. J.

The circumstances connected with the foundation of the Chicago house and a history of the growth of the business from that time form a very interesting part of the contents of this publication. Illustrations are given of the warehouses which have been successively occupied, together with a view of the very large warehouse which is now used as their headquarters, at Milwaukee avenue and Lake street. The corporation have also erected and nearly completed warehouses occupying, together with improved structural yards, the greater part of the block between Fifteenth, Sixteenth and Rockwell streets and the Pennsylvania Railroad tracks. The building, of two stories, is 175 x 266 feet in dimensions, 60 feet high, and has an annex one story in hight, 112 x 125 feet. Through the entire length of the main building and structural yards, 300 x 600 feet, a railroad track runs, which is connected directly with all lines. Over these tracks are two overhead electric cranes, one for each floor, which are served by trolleys running the entire width of the building. It is therefore possible to move steel in any form to and from cars, into and out of any part of the buildings, without dropping the load. In this warehouse machinery has been installed comprising a heavy electrically controlled plate shear, a powerful cold saw for heavy structural shapes and a combined machine specially built for shearing, punching or coping lighter beams, bars and angles.

In connection with this information relative to the house itself letters are published from old Western boiler makers, giving their reminiscences of early days in the West in the steel trade. The corporation now enjoy a most conspicuous position in the Western steel trade, carrying at all times one of the largest stocks of plates, sheets, hoops, bars and boiler makers' supplies in the world.

Hermon B. Butler as treasurer and Clyde M. Carr as secretary have been closely identified with the development of the business of the corporation for many years and have contributed materially to the success achieved.

The United States Fire Proofing Corporation of Pittsburgh will make extensive improvements at their works at Salineville, Keystone and Lisbon, Ohio. At the Salineville Works a new power house has been built and much of the equipment for it was furnished by R. Munroe & Son of Pittsburgh.

Kokomo Steel & Wire Company's New Rod Mill Started.

The new rod mill of the Kokomo Steel & Wire Company, Kokomo, Ind., when placed in operation November 17 made a most phenomenal start, turning out, as it did, perfect rods from the time the first wheel was turned. Three hours after the mill was running perfectly and is now stated to be producing as fine rods as go through any mill in America. This is said to be the only mill that has ever accomplished as much. The first billet put through the mill went clear through and came out in a nearly perfect bundle of rods. Out of 15 billets sent through 12 resulted in perfect rods, and the loss will not exceed 400 pounds of waste from the time of starting until it was working perfectly.

Much credit for the successful starting of the mill is due to the skillful and efficient workmanship of Thomas Harris, the foreman, who ran the Anderson mill for 13 years, and F. M. Mitchell, who was master mechanic of the Illinois Steel Company for 17 years; also the Garrett-Cromwell Engineering Company of Cleveland, Ohio, who had charge of its construction. The present daily capacity is about 250 tons, but with increased power they will be able to produce 400 tons of rods. The capacity of the nail mill is now about 3000 kegs per day and they can, if necessary, turn out 1,000,000 kegs a year.

The company write us that they will put their new rod mill on double turn within a few days and that the steel they purchased in foreign markets is working to their entire satisfaction. They manufacture wire rods, wire nails, market wire, barb wire, the Diamond corrugated steel spring wire fence, wire guards, fence posts, &c.

The Russian Sugar Bounty Case.

WASHINGTON, D. C., November 25, 1902.—The argument of the Russian sugar bounty case, involving the validity of the action of Secretary Gage in imposing countervailing duties on Russian sugar, which was made the basis of a retaliatory decree increasing the duties on American machinery and other metal products, has been concluded in the United States Supreme Court and an early decision is expected, both parties having united in securing the advancement of the case and otherwise intimating the desirability of disposing of it promptly. The case is on appeal from the decision of the United States Circuit Court of Appeals, which affirmed the decision of the Board of General Appraisers, holding that the manipulation of the export certificates issued by the Russian Government operated as a direct bounty upon exportation.

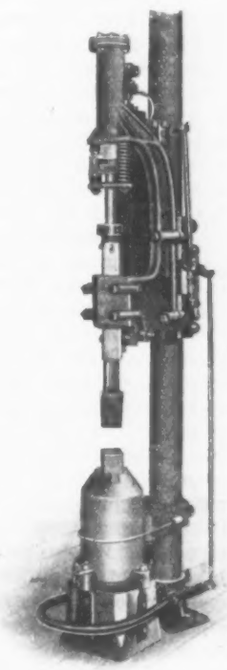
The administration officials confidently predict that the Supreme Court's decision will either sustain the Court of Appeals in the view that the Russian law actually provides a bounty, or that it will be held that the question is not within the jurisdiction of the courts, because it is within the exclusive discretion of the executive department of the Government. So confident are the officials that the courts will sustain the action of the Treasury Department that the State Department authorities are preparing to make vigorous representations to the Russian Government urging the rescinding of Minister de Witte's decree imposing retaliatory duties on American metal products.

The recent publication of misleading reports to the effect that the Treasury Department was about to withdraw Secretary Gage's order levying countervailing duties on Russian sugar has resulted in a deluge of letters from representatives of two important interests in the controversy—namely, the manufacturers of machine tools and the producers of beet sugar. The machinery manufacturers express the hope that the Department will see its way clear to withdrawing the countervailing order, at least until the decision of the question by the courts, while the sugar producers protest vigorously against any such action, asserting that unless countervailing duty is collected the American market will be flooded with cheap Russian sugar. The Department has replied to all these letters that "the continuation or suspension of countervailing duties on Russian sugars will depend upon the decision of the United States Supreme Court upon the question now pending before that tribunal whether Russia does, or does not, pay on the export of sugar bounties within the meaning of Section 5, of the act of July 24, 1897; when a decision is rendered it will be duly promulgated by this Department with proper instructions to customs officers."

The Department has uniformly held that it could not rescind its action in such cases, and this fact has been emphasized by the Assistant Attorney-General in his argument in the United States Supreme Court, in the course of which he said that "the point which might be urged in favor of executive authority to determine this question appears to have been definitely waived by Secretary Gage's voluntary submission to the judicial determination of the Board of General Appraisers and the courts." The case having been taken into court it cannot now be reviewed by the Department until it has been acted upon by the highest legal tribunal. W. L. C.

Compressed Air or Steam Hammer.

The American Engineering Works of Chicago have designed a post hammer, actuated by steam or compressed air, which is made in two sizes—namely, 100



COMPRESSED AIR OR STEAM HAMMER.

and 250 pounds falling weight. The illustration shows the latter mounted on a 12-inch steel column. These hammers are also arranged to be carried by a wooden post. The smaller size will handle any work up to 2¼ inches, square or round, while the larger size will handle anything up to 3½ inches. A special valve movement and treadle have been provided. The arrangement is such that a slight movement of the treadle causes the ram to rise to the top of its stroke and remain there for any length of time desired, thus enabling the operator to adjust the work or tools on the lower die. If the treadle is then pressed down to the limit the ram will give a hard, full blow, the same as a drop hammer; or, if desired, the treadle can be pressed down part way, when the hammer will give repeated light or hard blows, as may be required. The special valve gear permits one man to easily handle the hammer for drawing or regular forge work, or for die work similar to drop forgings. The change from one kind of blow to the other is made instantly and smoothly.

Notes from Great Britain.

Rails and Lumber.

LONDON, November 8, 1902.—During the last few days our attention has been called to the strength, durability and future use of heavy rails. At the Royal Society of Engineers Thomas Andrews read a paper on the effect of segregation on the strength of steel rails. Doctor Ewing, Professor of Mechanism and Applied Mechanics in the University of Cambridge, and J. C. W. Humfrey of St. John's College, Cambridge, contributed a joint paper to the proceedings on the fracture of metals under repeated alternations of stress. This paper describes an investigation by means of the microscope and of the process by which iron becomes "fatigued" and breaks down when subjected to repeated reversals of stress. In the particular metal dealt with—Swedish iron, having an elastic limit tension of about 13 tons per square inch and a breaking strength of 23.6 tons per square inch—the writers state that they found that a stress not exceeding 9 tons per square inch when reversed some millions of times was sufficient to develop cracks and to bring about the fracture of the piece. Stresses of 8 and even 7 tons per square inch were found to develop slip bands, which would probably turn into cracks under a sufficient number of reversals. The bearing of these experiments on steel rails is perhaps a little remote, but will doubtless be taken into account. The paper read by Mr. Andrews is the result of seven years' experiments upon steel rails. In the course of this long research Thomas Andrews has had resort to numerous chemical, physical and high power microscopic examinations on a large number of rails, in which local segregation of some of the chemical constituents had been detected, and the result of his investigations has demonstrated that local segregation of this nature distinctly reduces the general physical strength and main line endurance of steel rails where such segregation exists. He states that in the course of his experience he has examined many rails which have fractured in main line service in tunnels or bridges and on other parts of the permanent way, and he has been able in many instances to trace the cause of these fractures to local segregation leading to premature physical weakness in the mass structure of the rails when under the vibratory stress caused by heavy traffic. He shows that it is by no means uniformly the case that the chemical and physical properties of steel rails are uniform throughout their longitudinal and transverse mass structure. Hence the importance of eliminating in the course of manufacture, as far as practicable, any tendency to local segregation in steel rails which leads to non-homogeneity of structure.

Turning from these highly technical points, I come to some calculations which have been made by the president of the Institution of Civil Engineers, John Clarke Hawkshaw. This gentleman has a great deal to say that is very suggestive to rail manufacturers upon the relation of steel rails to the use of lumber on the permanent way. He tells us that in our enthusiasm for the great results achieved by iron during the last century we are apt to overlook the future of lumber. Engineers in England could not do without lumber, nor, indeed, without much lumber. For instance, in the year 1901 the number of loads of coal pit props imported into this country was 1,879,810. On railways, if we took the length of single line in the United Kingdom including sidings at 45,800 miles, there were in use about 90,000,000 sleepers, and the annual consumption for renewals might be taken at about 3,750,000 sleepers a year. Much lumber was used in railways for other purposes, for fencing, for telegraph and signal posts, for buildings and rolling stock. Another large item is the lumber used for temporary work. In Europe there were only five countries which exported lumber—Russia, Sweden, Austria-Hungary, Norway and Roumania—and the amount exported by these was nearly 2,750,000 tons short of the total amount required in Europe. Of the lumber imported into this country in 1899 more than nine-tenths in weight and nearly four-fifths in value was coniferous wood, grown in the temperate countries of the northern hemisphere, and this was the lumber most largely consumed in engineering work. As Europe could not supply its own wants, our only other source was Canada. India required its own deodar forests. Siberia was as yet unworked, and the distance was too great. New Zealand has already exhausted its Kauri pine forests. The only country we could look to for the lumber we must have was Canada. Canada still had, it was said, 38 per cent. of its area forest, but much of what was called forest was not lumber producing. Doctor Sohlich said not more than one-third. But while the grass grows the steed starves, and undoubtedly the question of railway sleepers will before long become a pressing problem, not only in this country, but also in tropical climates where insects eat into the wood with serious results. In these circumstances it is a little surprising to me that iron and steel manufacturers do not contrive in some way to substitute their own made sleepers for the lumber which is now so largely used.

The More Recent Attitude Toward Trusts.

One of the most pleasing aspects of the whole discussion on the subject of trusts and combines is the apparent absence of unreasoning bias. A year or so ago, when it almost seemed as if the system of trusts would spread over the whole earth like a gigantic octopus, many angry things were said as the result of fear. Every few years we get into a groove, and when some new event happens we are startled out of our wits and take to clapping our wings like owls when the light is turned upon them. But during the months that have gone by there has been a marked disposition to regard the whole question of industrial reorganization with a perfectly open mind; and this assuredly makes for progress. The practical British mind is just now concerning itself with the problem whether the Atlantic combine will pay. On the whole, conservative men on this side think that the Atlantic combine will not in itself pay, but that its indirect results may be exceedingly profitable. Of course it might suit American financial interests very well to work the Atlantic traffic at a loss if enormous shipments of American manufactured goods can be dumped on the European and world market. It is simply a question of distributing a small loss on transit over a very wide manufacturing area.

Meantime, the arrangements reached by the ship building firm of Harland & Wolff of Belfast are certainly good business from the point of view of that north of Ireland firm. At the Queen's Island all the available slips are occupied with steamers in various stages of construction. The work in hand includes vessels for the White Star Line, P. & O. Line, Atlantic Transport Line and Pacific Steam Navigation Company. In addition to these a large number of steamers is undergoing repairs. The Atlantic Transport Company are having built at the Queen's Island three mammoth vessels, which will be called "Minnehakta," "Minnewaska" and "Minnetowra." The vessels, which will be the latest and most up to date in every respect, will be 13,000 tons each. This of course is the result of the agreement entered into by the shipping combine, who are bound by that agreement to give the work of building all new vessels for the combine to the Queen's Island Company. There is also being built on the Queen's Island a vessel which is modestly announced to be a sister ship of the "Cedric," but which it is understood will be 75 feet longer than the "Cedric," although of less beam. It is also stated that the managers of the combine have decided when the last mentioned ship is launched to put down in Belfast two new steamers rivaling in every point the two new Cunarders being built on the Clyde.

In considering facts like these, it is no wonder that the more logical commercial magnates are adding up the pros and cons of the reorganization of industry on the lines of trusts and combines.

New Ships to Foreign Purchasers.

I append herewith my usual monthly statement of the ships delivered to foreign customers by British shipbuilders for the month of October, showing the

ship's name, port at which built, destination, flag and gross tonnage:

	Tons.
No. 1, Renfrew, Cronstadt, British	495.75
No. 558, Renfrew, Port Said, British	134.12
"Algol," Middlesbrough, Helsingfors, Russian	2,087.85
"Aotea," Kinghorn, Wellington, N. Z., British	204
"Badenia," West Hartlepool, Germany, German	6,499.57
"Bidassoa," Renfrew, Havre, French	554.78
"Cavanba," Paisley, Sydney, British	573.44
"Kooringa," Port Glasgow, Adelaide, British	339.10
"Mataquito," Annan, Valparaiso, Chilian	277.5
"Moeraki," Dumbarton, New Zealand, British	4,392.01
"D. Negropontes," Sunderland, Marseilles, Grecian	2,575.32
"Riga," Renfrew, Riga, British	853.15
"Tancred," Wellington Quay, on Tyne, Calita Buena, Norwegian	3,503.24
"Victoria," Dundee, Melbourne, British	2,969.19
"Viotia," Middlesbrough, Andros, Grecian	3,032.83
"Luiho," Renfrew, Keelung, British	424.63

Admiralty Contract Penalties.

It is stated that the Admiralty intend for the future to inforce more stringently the penalty clause for the late delivery of contract work. A notification suggesting this has been issued in connection with the two third-class cruisers for which tenders have this week been submitted. The time for delivery laid down in connection with these cruisers, which are of 3000 tons displacement, 9800 horse-power and 21¾ knots speed, is 21 pounds, which is probably quite adequate; the penalty for late delivery is £40 per day, and it is stipulated that the trials must be completed within ten weeks, otherwise the penalty will be £20 per day for any time in excess of the ten weeks. These are undoubtedly high penalties, especially when it is borne in mind that the value of the contract for each of the vessels does not much exceed £190,000. Such penalties of course have been included in contracts in the past, but there have been very few instances of builders becoming liable for payment; and in such cases it has been invariably the case that strikes and other similar unavoidable causes have operated against the fulfilment of the contract conditions.

An Addition to the Rolling Stock Combine.

The rolling stock combine, the particulars of which I sent some months ago, has now absorbed the Patent Shaft & Axletree Company. The Patent Shaft & Axletree Company have an issued capital of 35,000 fully paid 5 per cent. preference shares of £6.10 each and 29,566 ordinary shares of £7 each, upon each of which the sum of £4 has been paid and upon 1000 of which £3 per share has been paid in advance of calls. Debentures have also been issued to the amount of £29,800. The business of the Patent Shaft Company is taken over by the combine as from April 1, 1902, the end of their last financial year, and the amalgamated company assume liabilities as from that date, including the debenture debt. Provision is made upon the agreement of amalgamation for the conduct of the business by a new company under the same name, the capital of which will be held by the combine. The proposed amalgamation will enable the company to manufacture the wheels, tires, axles and other iron and steel work for their business, and thus materially strengthen their position.

An Austro-Hungarian Cartel.

Following is a press cablegram from Vienna, dated November 23:

After several months' negotiations the Austrian and Hungarian iron and steel industries have succeeded in forming a gigantic combination comprising 23 separate establishments, the capital of which aggregates $70,000,000. The new organization is not a trust, but a cartel or combination, under which each establishment is worked separately, though all are supervised by a central board which regulates the output and fixes prices. This cartel includes practically every important iron and steel interest in the dual monarchy, such as the production of pig iron, bars, plates, rails, nails and wire. The agreement will be effective for ten years, expiring June 13, 1912. The Austrian and Hungarian cartels are organized separately, but worked jointly. The Austrian combination has 18 members and the Hungarian five. It is anticipated that this organization will result in great improvement in the industrial situation, which just now is exceedingly unsatisfactory, particularly in the engineering, locomotive and railroad car branches. Of 20,000 machinists in Vienna 8000 are reported to have been discharged recently. The car and locomotive works in other parts of the country are employing only half the usual force, and one result of these conditions is a large increase in emigration, particularly from the iron districts of Bohemia, whence hundreds of persons have lately gone to Canada, Mexico and the Transvaal. The general situation, however, is likely to improve shortly, when extensive public works, including the construction of canals and railroad bridges, will be begun. These public works in Austria will, it is estimated, cost $75,000,000 and in Hungary $37,500,000.

Test of the New Niagara Power Tunnel.

On Wednesday, November 19, the Niagara Falls Power Company, Niagara Falls, N. Y., made a most interesting test of the capacity of their big power tunnel, which is over 7000 feet long, 21 feet high and 18 feet wide, the object of the test being to ascertain, in advance of the completion of the installation in wheel pit No. 2, if the tunnel is large enough to carry off the water from turbines developing 100,000 horse-power. This is the rated capacity of the tunnel, and while the Power Company had no misgivings as to the results of the test, yet the opportunity presenting itself, it was felt that the determination of practice might just as well supplant theory.

In order to determine with accuracy all features of the test the company's engineering corps was well represented, and Clemens Herschel of New York, consulting hydraulic engineer, was present. The tests started at 10 o'clock in the morning and finished at 5 o'clock in the afternoon, and throughout this period the service to none of the Power Company's tenants was interrupted, excepting that of the International Paper Company, who kindly shut down their entire plant for less than an hour, in order that the discharge from the paper mill, 8000 horse-power, might not be observed in connection with the discharge from the two wheel pits. The paper mill wheel pit is connected with the main tunnel by a lateral, and with the exception of the period mentioned the discharge from its wheels swept through the tunnel in connection with that from the two wheel pits of the Niagara Falls Power Company, showing the tunnel to have a capacity of at least 108,000 horse-power.

The quantity of water that passed through the tunnel was nearly twice as great as many notable rivers carry, and about double the amount ever before passed through the tunnel up to this time. The water was discharged into the tunnel through the operation of the ten wheels in pit No. 1 and three in pit No. 2, while an additional amount of water to make up the quantity necessary for the development of 100,000 horse-power was sent into the tunnel through three other penstocks and wheel casings in pit No. 2. Although it was a mighty flood, it was but a small fraction of the flow of the Niagara River, and its diversion was not observed, so far as the falls were concerned. However, down in the lower river the spectacle created by the torrent that poured out of the portal attracted great attention. This discharge extended clear across the lower river to the Canadian shore, and it was noticed that a portion of the surface current went up stream and a portion of it down stream. Engineers stationed at the portal observed that considerable space was shown between the top of the arch of the portal and the rushing volume of water, practically the entire semicircular arch remaining above the level of the rushing water.

One effect which this full discharge of water from the tunnel may be expected to have upon the lower river will be the earlier formation of ice bridges, as the stream from the portal will have a tendency to hold back the floating ice until a bridge forms. This is likely to result in Niagara having more magnificent ice bridges in the future than in the past. Viewed from every point the tunnel tests were pronounced a great success, and the Niagara Falls Power Company are pleased to demonstrate by actual use how well and carefully their engineers planned and built this great tail race under the heart of the city of Niagara Falls.

The Suppression of Smoke in Steam Plants Using Bituminous Coal.*—VII.

BY ALBERT A. CARY, NEW YORK.

(*Concluded.*)

Down Draft Furnaces.

We now come to a consideration of furnaces which have their fresh fuel charged in such a manner as to cover the entire upper surface of the incandescent fire bed, and, instead of allowing the resulting gases to rise and pass into the furnace and combustion chamber, the draft draws these freshly distilled gases downward through the hot bed of coke beneath the newly charged coal; then, after passing through the grates supporting the fire bed, they finally pass from what is usually called the ash pit into a combustion chamber located at the rear of the furnace.

It is due to the fact that the chimney draft draws the gases (distilled from the recently fired coal) down through the fire bed and grate bars that this design of furnace is called a down draft furnace. Such furnaces were built and operated half a century ago and furnaces approximating this method of operation have already been described under the heading of "Various Arrangements of Brick Arches and Furnace Walls," and illustrated in Figs. 7, 8, 9 and 10.

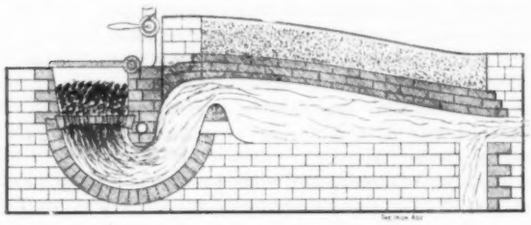


Fig. 25.—Fairbairn's Down Draft Furnace.

It will be seen that the method used in operating a down draft furnace is essentially a coking method of firing. The freshly fired coal first has its volatile matter distilled off and becomes, more or less, a coke, and finally the heat generated from the combustion of this coke is utilized to maintain a very high temperature for the purpose of hastening the combustion of the volatile gases distilled from the next charge of coal. When this design of furnace is used it is generally customary to leave the upper firing doors of the furnace open all the time, and through them the necessary supply of air is introduced to the furnace, while the lower or ash pit doors are kept closed, to prevent the lowering of the draft pressure.

About 40 years ago Charles Fairbairn read an interesting paper before the Edinburgh and Leith Engineers' Society, describing a down draft furnace he had invented and used, after having had a considerable experience in furnace construction. Fig. 25 shows a side sectional view of Fairbairn's design, which was applied to a puddling furnace and was operated under a forced draft. It will be seen that in place of the usual cast iron grate bars (which, if used, would soon burn out) a fire brick grate is substituted, which consists of a number of narrow brick arches placed side by side, having open spaces between them similar to the regular openings in an ordinary fire grate.

After obtaining an incandescent bed of coke of proper depth upon this fire brick grate, fresh coal is charged from above upon the surface of the fire bed, the flap door on the floor level being raised for this purpose. After thus stoking the fire, the flap door is closed and the valve of the forced blast pipe (shown in the illustration) is opened, blowing a blast of air upon the surface of the freshly charged coal. This air passes downward with the gases distilled from the coal and together they traverse the hot bed of coke beneath, whence they issue, highly heated, and after continuing their downward passage through the grate they enter the combustion chamber below, where a very rapid and intense combustion takes place. The products of combustion along with the unconsumed gases finally pass on to an adjoining reverberatory furnace chamber, as shown.

In the paper describing this down draft furnace Mr. Fairbairn sums up his views concerning "indispensable conditions entering into good furnace design" (which led him to construct this furnace), as follows:

1. A good draft, which can be regulated at will, so as to avoid forcing the fire too much.
2. A large and roomy combustion chamber, surrounded with fire bricks, and removed, if possible, from the place where the heat is to be used.
3. That the sides or walls of the furnace have at least ten thicknesses of bricks (*i.e.*, about 25 inches) nearest the fire, and an outer wall, having an air space between of about 3 inches.
4. That the supply of air to the furnace can be regulated at will.

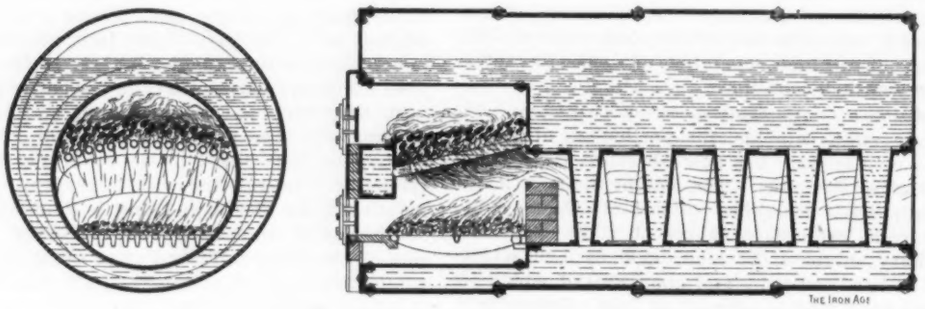


Fig. 26.—The Eastwood Down Draft Furnace.

After describing the furnace he sums up the advantages he succeeded in obtaining as follows:

1. The whole of the gaseous products are made available.
2. There is entire absence of smoke in consequence of perfect combustion.
3. There is a smaller quantity of air required, probably about one-fourth less; that is, about 18 pounds of air to the pound of coal.
4. No increase of temperature above the external air is required in the chimney, and the escaping heat from the furnace can be used for other purposes.
5. A higher temperature in the furnace, and more rapid circulation of heat.
6. The perfect control which the attendant has over the furnace as regards temperature, and getting the fire lighted and into operation in less time, when the furnace has not been in use.

In Fig. 26 will be seen another form of down draft furnace, which is, perhaps, a design more familiar to most readers. This was patented in England, by Eastwood, in 1862. In this furnace it will be seen that two sets of grate bars are used. The upper or principal grate is constructed of tubes designed to have a constant circulation of water passing through them, for the purpose of reducing the trouble of burning out caused by the intense heat concentrated upon them as the burning gases plunge downward through the spaces between the tubes. The lower or supplemental grate is placed below the upper one to catch such unconsumed fuel as falls through the upper grate, which is considerable, on account of the difficulty of retaining the fuel on a grate thus constructed with tubes. Such fuel, if

* Copyright, 1902, by Albert A. Cary.

not too much obstructed with ash, will complete its combustion on this lower grate.

The method of operating this furnace is quite similar in many respects to that just described in connection with the Fairbairn furnace. All the fresh coal is fired upon the incandescent coke bed of the upper furnace, and the chimney draft draws the distilled gases and air (entering the upper furnace doors) down through the highly heated coke and the grate bars beneath it, rapid combustion taking place in the interior of the fire bed and beneath it, as the burning gases pass through the combustion chamber. The air being split up into small streams as it filters through the fuel bed and becoming highly heated, is in the best possible condition to allow its oxygen to combine with the combustible gases and coke (and also for mixing ultimately with them), and the result is a very rapid and intense combustion.

One of the principal difficulties found in using this form of furnace is due to scale formation in the tubes of the water grates. On account of the intense heat to which these water tubes are subjected a very rapid evaporation of the water takes place within them and, of course, when the water passes into steam it precipitates all of the scale making impurities it contains. The rapid circulation of the water in these tubes is supposed to carry this precipitation out of them, but practice has shown that it does not always succeed in doing this, and when once the scale begins to form in the tubes it builds up in thickness more and more rapidly until, in some cases, the tube becomes entirely filled, and burning out then follows very quickly.

With "good" water, or with properly purified "bad boiler water," this trouble is largely removed, but even under such favorable conditions these tubes should be thoroughly cleaned and scraped at frequent intervals.

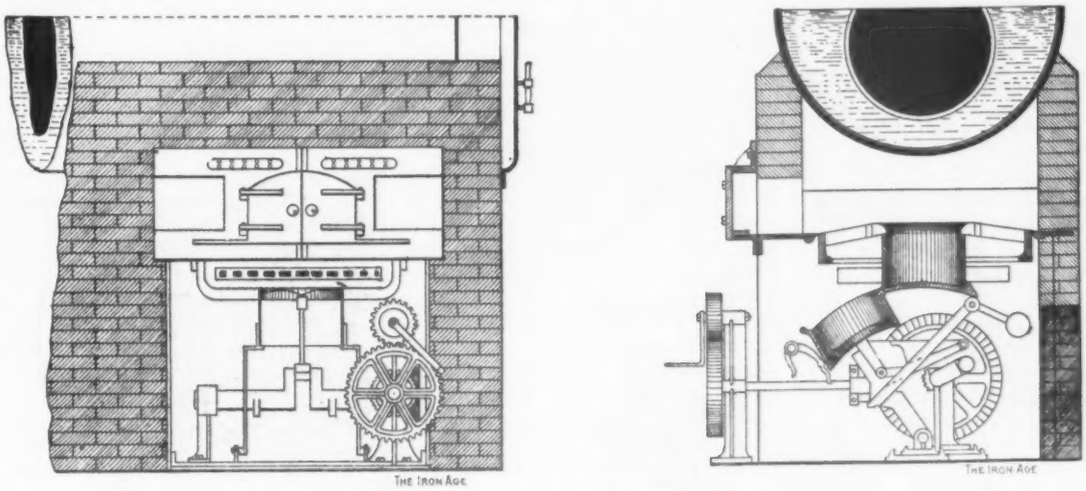


Fig. 27.—The Frisbie Underfed Stoker.

THE SUPPRESSION OF SMOKE IN STEAM PLANTS USING BITUMINOUS COAL.

Another complaint frequently offered is that these water grates are made a part of the water containing part of the boiler itself, so that any serious trouble occurring to the grates, such as burning out or leaking tube ends, will necessitate the complete shutting down of the boiler.

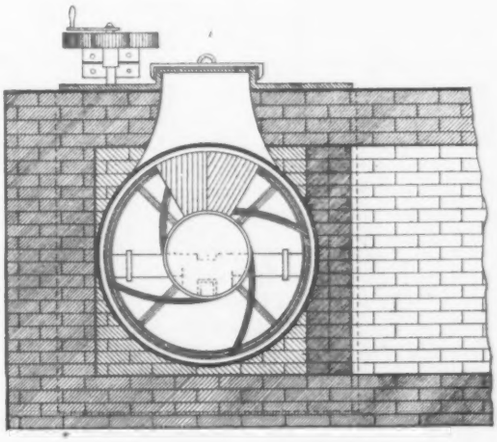
Underfed Furnaces.

Should we take the Fairbairn furnace, shown in Fig. 25, and turn it upside down (and, for sake of illustration, suppose that the fuel bed would retain its orginal position) we would then have the essential features of an underfed furnace.

We now find our fresh fuel underneath the bed of incandescent coke, and means must be provided to constantly feed new coal into this lower position as fast as its top layer has its volatile gases distilled off (thus becoming more or less of a coke). The fire brick grate (or, in other cases, the water grate) could then be dispensed with, and a cast iron grate may be used under the cool fresh coal to support the fire bed. The forced blast pipe will be retained to force the required air supply through the fuel bed, as will be described later.

The two mechanical devices used for feeding the fresh coal under the fire bed are pistonlike plungers and feeding screws. When the ramlike plungers are used the coal must be fed in front of the pistons when they are drawn back as far as their motion will permit (away from the fuel bed), and then the plunger is made to advance toward the furnace, forcing up the fresh coal in front of it under the fire bed, which coal is guided into the desired position through properly designed passageways.

When a conveyor screw is used the fresh coal is fed onto the outer end of the revolving screw, which, by



turning in its casing, causes the coal to move toward the inner end of the screw. As the coal is fed to the conveyor in a continuous stream, the conveyor trough, or retort (as it is commonly termed), soon becomes filled, and as more coal is fed into the retort that which preceded it is displaced and is forced forward, through a properly arranged passageway, to a position under the fire bed above it.

Advantage is taken in both of these (plunger and screw) devices of the semilubricating quality of coal, which offers, comparatively speaking, little friction in its movement over the metal surfaces with which it comes in contact.

When the fresh coal is thus fed under a bed of highly heated coke its volatile gases are rapidly distilled off when the two come in contact. By forcing an ample supply of air through the lower layer (of coal) both the combustible gases and the air rise together through the upper bed (of incandescent coke), splitting up into small streams and then becoming intensely heated. The gases and coke now burn very rapidly, and

the result of such approximately complete combustion (when all required conditions are properly met) is the generation of intense heat in and immediately above the fire bed.

In the 1876 volume of the proceedings of the British Institution of Mechanical Engineers will be found a discussion by Sir F. J. Bramwell, in which he described an underfed furnace which was in operation at the Woolwich (Eng.) Dockyard in 1846.

This was a plunger fed furnace operating under a "wagon" type of boiler. The grate was nearly square and contained a square opening in its center, through which a square piston carrying a charge of fresh coal was made to rise, thus introducing coal under the fuel bed. After delivering its fuel the piston was dropped to receive another charge, but in order to retain the fuel bed in place over the central opening a slide, working on the upper surface of the grate bars, was pushed over the aperture. This furnace is reported to have given excellent results. The only trouble mentioned was difficulty in moving the shut off sliding plate across the opening. It is stated that this mode of firing "gave a beautiful smokeless flame" with intense heat immediately above the central part of the furnace, where the fresh coal was charged in it.

In 1868 Myron Frisbie of New York patented an underfed stoker. Due to the more general use of automatic stokers abroad at that time than in this country, he took his device to England and interested Holmes & Walker of Birmingham. After some experimenting they introduced several improvements into the original Frisbie stoker and produced the apparatus illustrated in Fig. 27, which did very good service in a number of plants. This illustration shows the stoker used in connection with a Lancashire boiler, and it will be seen that the front of the furnace, instead of being placed in the front of the boiler, opens out from the side wall of the boiler setting, near its front end.

The part full front elevation shows the cylinder (through which the coal is fed to the furnace) in section and the coal charging piston raised to its highest position. The cylinder (or coal box, as it is termed) is supported in place by two side levers, which are pivoted

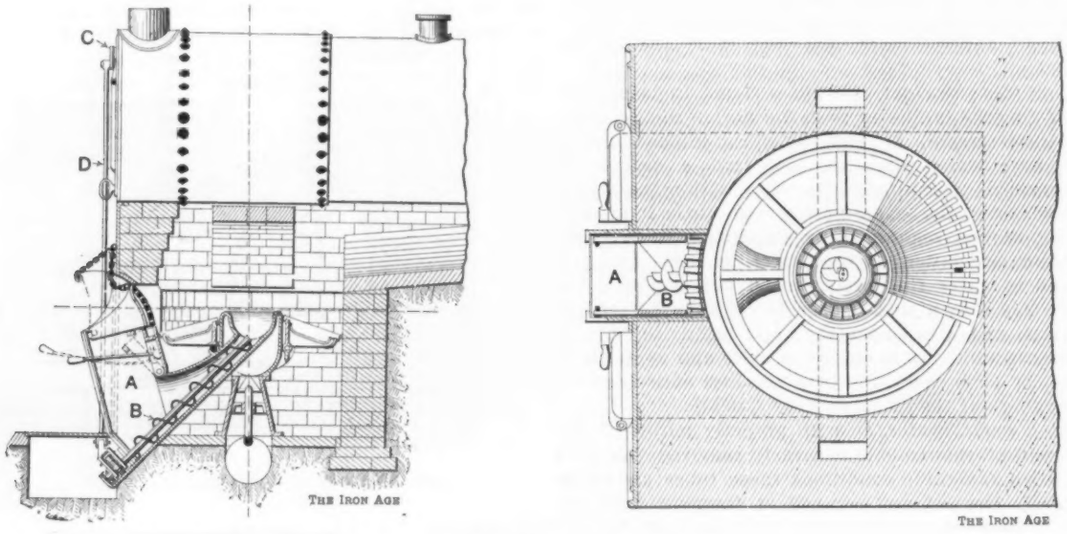


Fig. 28.—The Worthington Underfed Stoker.

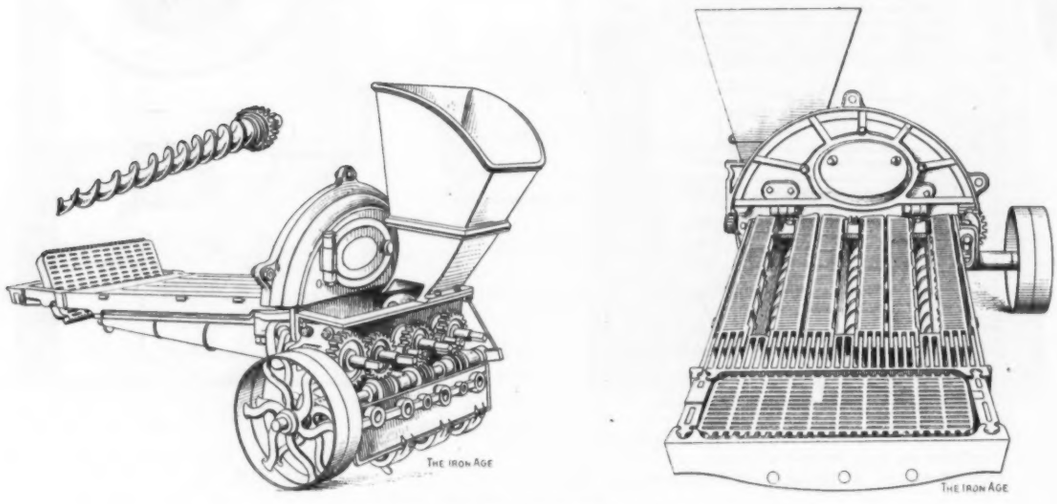


Fig. 29.—The Smith Underfed Stoker.

THE SUPPRESSION OF SMOKE IN STEAM PLANTS USING BITUMINOUS COAL.

near the bottom of the ash pit. By turning the crank handle (shown in the view) in one direction the piston is lowered to the bottom of the coal box (by a system of gears and levers) and then the coal box is automatically tilted forward into the position shown in the side view of the furnace. As the coal box is thus tilted, an apron attached to it (at the rear) is slid across the opening into the furnace and thus the fuel above is prevented from falling into the ash pit.

Coal is now shoveled into the coal box, and the crank is then turned in the opposite direction, which tilts back the coal box into a position directly below the cylindrical opening into the fire box. As we continue turning the crank the mechanism elevates the piston and the coal is pushed under the incandescent coke bed on the grates in the fire box above.

The grate frame is made like a turn table, having

its sector shaped grate bars supported as shown in the upper (plan) view, and by inserting a lever into the edge openings in the grate frame the whole grate is turned around its center so as to facilitate the removal of ash and clinkers from all parts of the grate surface by bringing them opposite the cleaning door.

In 1884 Amasa Worthington took out a United States patent for a conveyor screw underfed furnace, shown in Fig. 28. By referring to the side elevation it will be seen that a hopper, for coal, is provided in front of the furnace, at A. The outer end of the conveyor screw B is placed at the bottom of this hopper, so that a supply of coal is always resting upon it. The conveyor screw is rotated through successive small angles by a pawl and ratchet, this method of feeding being found more desirable than a continuous turning of the feed screw (the former causing the fire bed to rise and fall and so break up the top crust). At C will be seen the revolving shaft, which communicates its motion to the feed screw by the use of a crank and connecting rod, D.

At the furnace end of the screw will be seen a bowl-shaped casting, which receives the coal during its passage from the screw end to the underside of the fire bed. Around the upper edges of this bowl-shaped casting will be seen tuyere openings, through which the forced blast of air issues, and then, after passing through the fresh coal, it enters the incandescent coke bed above, mingling and mixing with the volatile gases distilled from the coal, and, as its temperature is raised to the degree of ignition, combustion follows.

We have now examined what might be called vertical feed furnaces, which undoubtedly have a certain field of usefulness, but for boiler furnaces horizontal feed apparatus, both of the plunger and screw type, are more commonly used. Fig. 29 will illustrate the general construction of such horizontal underfed furnaces. This furnace was invented by Holroyd Smith of Halifax, England, in January, 1878, and was built by the Helix Furnace Feeder Company of Lancaster, England, and operated successfully in a number of plants in that country. It was also exhibited at the Paris Exposition in 1878.

The right hand illustration shows a top perspective view, with two narrow side grates and two central grates running the length of the furnace. Between these fixed grates are three U-shaped troughs, containing at their bottoms a tapered helix or feed screw, shown clearly in detail at the upper left hand corner of the illustration. These U-shaped troughs are deeper at their front end than at the rear, as shown in the side perspective view. Outside of the furnace front, beneath the furnace door, is a coal trough running from one side to the other of the furnace front, and at the bottom of this cross trough the outer ends of the feed screws are contained.

Surmounting this cross trough and at one side is a coal charging hopper. As the coal drops from this hopper it falls upon a cross conveying screw, which distributes the fuel evenly to each of the three furnace feeding screws beneath it, and they in turn, as they rotate, feed this coal into their respective troughs. The bottoms of these three troughs are thus soon filled, and as more coal is forced into them by the turning feed screws the coal previously fed is forced upward to the level of the grate bars.

The fire is built on the surface of this coal and the grate bars each side of the troughs. The motion of the feed screws is stopped temporarily and coal is fired by hand until there is a bed of incandescent coke formed. Hand firing is then stopped and the feed screws are started to revolve, which sends fresh coal upward from each of the three "retorts" under the incandescent coke bed, and from this time the fire is operated as previously described.

This device shows a continuous coal feed, but another feed device was made by this company, operated by a pawl and ratchet in a similar manner to the Worthington stoker, already described. I might add that the worm gears, shown in Fig. 29, are attached to the shafts of the feed screws by a clutch device, any one of which can be thrown out of operation by moving a lever (not shown), and thus the fuel bed can be leveled up when desired.

The tendency of these revolving feed screws is to work the top of the fuel bed back toward the rear of the furnace, and advantage is taken of this movement to provide for the removal of the clinker and refuse, as experience shows that this is what is eventually found in the rear of this furnace. A dumping grate is provided at this position, which is dumped periodically by pulling out a lever extending in front of the furnace (not shown).

This illustration, Fig. 29, shows a furnace adapted to the circular flue of an internally fired boiler, and by closing the lower front of this flue a forced blast can be introduced under the grates. The horizontal plunger feed furnaces have one or more similar U-shaped troughs placed below the top level of the grates. After coal from the charging hopper (in front of the boiler) drops in front of the ram, the plunger is forced horizontally into the outer end of the retort, which forces the coal already in the retort upward under the fire bed, as has already been described. The power is delivered to such plungers from a steam cylinder placed tandem behind it, or by a system of levers, cams or toggle joints.

Australian Notes.

We have the following advices from a special correspondent in Australia:

Railway and heavy iron contracts are being continually advertised, usually in comparatively small quantities, by the railway departments of the various States. In the course of a year they must total a fairly respectable sum, and these miscellaneous lines, such as steel bars, channel steel, weight bridges, engine tires, emery wheels, lavatory fixings, urinals, odd lines of machine tools for the railway work shops, traveling cranes, &c., are usually spanned up by British agents. Certainly very few of them go America-ward. Your correspondent suggests that it would pay enterprising firms in America to make arrangements to be promptly furnished with these little details of tenders. If it cannot be done with the various State Departments, then surely some arrangement could be made with the American Consuls in the different capitals to promptly send particulars to some recognized center in New York, where the information would be available for American manufacturers.

The Sydney Harbor Bridge designs have been adjudicated upon, and the designs of either J. Stewart & Co., the E. & C. Bridge Company or the Arrol Company are to be recommended for acceptance. The public will believe in the long promised bridge when it is built, and not before. A large section of the people feel that it would be wiser to put the one and a half millions sterling into works of irrigation and water conservation. Considering that the drought has had the effect of so reducing the Sydney water supply that at present the inhabitants of that city are forbidden to hose their gardens, or even to use a plunge bath, there is a certain amount of sense in the contention.

The Rosedale Foundry & Machine Company of Allegheny, Pa., who are a consolidation of the Rosedale Foundry Company and the Specialty Mfg. Company will build a large new plant in Allegheny. It will consist of a foundry and machine shop of steel construction, 90 x 432 feet, and a power plant 32 x 60 feet. When the new machine shop is completed the present works of the Specialty Mfg. Company in Allegheny will be abandoned. The contract for the steel buildings has been placed with the Riter-Conley Mfg. Company of Pittsburgh, Pa. The consolidation of these two interests was made in August and the capital is $200,000. The officers are: J. H. White, president; H. L. Irwin, treasurer, and William H. Hamilton, secretary.

According to the London *Ironmonger*, the lead returns compiled by Julius Matton estimate the production of pig lead during 1901 as 869,000 gross tons, of which Spain contributed 167,000 tons (94,000 tons of soft lead and 73,000 tons of silver lead), the United States 263,000 tons, Germany 119,000 tons, Australia 95,000 tons, and Mexico 85,000 tons.

Notes from Scotland.

The Pig Iron Trade.

GLASGOW, November 14, 1902.—The iron warrant market has not been lively this last week or two, although a good deal of business has been done in it in the closing and reopening of "bear" accounts. There is no doubt the bear influence has been operating a good deal, on the strength of the reports from your side, which are held to indicate the approach of weakness. But among smelters and holders of iron this influence has no effect, the belief among them being that even if the top has been reached in America it will be a good while before there will be any superabundance of pig iron here. And as orders are still coming in from your side there is a probability that the year's shipments to the United States may reach the 500,000-ton figure by the end of December. In October they reached 55,003 tons, as compared with 3074 tons in October, 1901. During the ten months ending October they aggregated 336,147 tons, as compared with 36,379 tons in the corresponding ten months of 1901. If, then, the shipments during November and December increase in the same proportion as those in October the total of 500,000 tons will not be far to seek on the 31st of next month. I should say that there are fully 100,000 tons now on order, either being shipped or to be shipped, as freight can be got from the Clyde, the Tees and the Cumberland or Lancashire ports. Freights are now pretty low again, though not quite back to the lowest rates touched just before the coal rush for America, when a charter was effected at 5 shillings 10½ pence from the Tees to Philadelphia for a cargo of pig iron. This week a steamer has been chartered at 7 shillings 3 pence from Middlesbrough to Philadelphia; another at 7 shillings 3 pence, Tyne to Baltimore, and another at 7 shillings 9 pence, Hartlepool to Baltimore, all for pig iron of Cleveland and East Coast hematite makes. These three cargoes alone will represent 10,000 to 12,000 tons. I also hear to-day of another vessel chartered at 7 shillings to ship 3000 tons in the Tees for Baltimore at the end of this month. These charters are all the work of the last few days and the iron is not yet away. And this week some 20,000 tons of Scotch iron have been sold for shipment to the United States during the next three months. Most of the Scotch iron goes by the liners. Meanwhile the shortage in the United States has further increased our shipments to Canada. Thus in October, 1902, we sent there 9357 tons, as compared with 2537 tons in October, 1901, and in the ten months ending October, 1902, we have sent 38,014 tons, as compared with 7509 tons in the corresponding ten months of 1901. However, the shipments in that direction will not count for much until the winter is over.

What I wish to point out is that, however the bears may depress or try to depress the warrant market, and bears are always in evidence here, the real market is still being sustained by the continued requirements of America. There have been fluctuations in warrants as short sellers reduced their obligations or put out more, but makers' prices have not altered. Local consumers, too, have been buying a little more freely, as if they perceived the possibility of pig iron becoming even more scarce during the winter and until America is satisfied. Connal's Glasgow stores now hold only half as much as they did at this time last year, and the Middlesbrough stock is under 122,000 tons. Every week something is being taken out of each warrant yard, chiefly to make up export cargoes. The whole public stock in the United Kingdom is now only 177,000 tons. While I write Scotch warrants are 56 shillings 3 pence, Clevelands 50 shillings 9 pence and Cumberland hematites 59 shillings 3 pence—moderate figures in the circumstances. East Coast hematite is 57 shillings and Scotch hematite 61 shillings 6 pence. As regards makers' iron, Coltness is 69 shillings 6 pence for No. 1, 60 shillings for No. 3; Gartsherrie, 65 shillings for No. 1 and 59 shillings for No. 3; Calder, 65 shillings for No. 1 and 59 shillings for No. 3; Eglinton, 60 shillings for No. 1 and 56 shillings for No. 3; Glengarnock, 68 shillings for No. 1 and 59 shillings for No. 3; Carron, 68 shillings for No. 1 and 59 shillings for No. 3. In Middlesbrough Cleveland No. 3 has been selling at 50 shillings 9 pence, f.o.b., but makers are now asking more. Forge iron is rather duller—gray at 48 shillings 6 pence, mottled at 47 shillings 9 pence, and white at 47 shillings, Tees. No. 2 Foundry is 50 shillings 3 pence. In finished iron and steel I do not know that any change can be noticed since I last wrote. Makers are fairly well employed in some sections, but rather slack of orders in others. In the Clyde district makers of shipbuilding, boiler making and engineering material are working well on contracts, but are not booking much ahead. In the North of England these branches are not nearly so well occupied.

Coal Matters.

A trouble in the iron trade is again the cost of fuel. As the markets for manufactures are, coal ought to be getting cheaper. As a matter of fact, it is being forced up, partly by coal owners and partly by the demand of the miners for higher wages. The Scotch miners are demanding an advance of 12½ per cent., and the Conciliation Board have ordered an audit of colliery books to see what, if any, advance in prices the coal masters have been receiving since wages were last adjusted. But meanwhile the coal masters have advanced splint coal for the iron furnaces 1 shilling per ton, and house coal 1 shilling per ton, for deliveries beginning this month. These advances will not figure in the audit of the September and October sales. Nor are they justified by any improvement in either home or foreign demand. Our total coal exports last month would have shown a decrease had it not been for the exceptional demand from America. That demand is now over and the shipments will drop off, while our home industries will suffer and shrink if fuel costs are raised. Nevertheless, the coal miners in the Midlands of England are, like those of Scotland, insisting upon an advance, and the miners of Wales are getting nearer and nearer to a strike for the rejection of the sliding scale as an automatic mode of regulating wages by the current market prices for coal. And every week the competition of German iron and steel in our markets seems to be becoming more eager.

The Shipbuilding Trade.

One of the movements on foot here is the widening and deepening of the upper reaches of the River Clyde so as to permit of larger merchant vessels and heavier battle ships than have been yet built being floated down from the building yards at Glasgow to deep sea water in one tide. To admit of this there will have to be a minimum depth everywhere in the channel of 30 feet at four hours' flood tide. At present there are some parts where the comparative depth is only 26 to 27 feet. The dredging and blasting operations will be within a length of 12 miles or so, but not for the whole of that distance. The work will be carried out by the Clyde Navigation Trustees, who have undertaken that it shall be completed within two years, so that any builders in the Glasgow area may take on contracts for the new Cunarders or for extra heavy battle ships in the full assurance that the tidal channel will be ready for the largest monsters by the time they are ready to take the water.

Besides the new Cunarders, the orders for which will have to be placed very shortly, shipbuilders are interested in a contract for a new first-class armored cruiser which the Admiralty are about to place. The tenders are now being considered. A similar vessel is to be built at one of the Government dockyards, but the machinery for this one will be bought on contract. Both vessels are to be of quite a new type. The guns and armor are to be arranged after the manner of a battle ship rather than of existing cruisers, and the armor plating is to be carried round the ends of the ships on the water line. Each cruiser is to carry ten 6-inch guns, five on each broadside, and six 9.2-inch quick firers in barbettes. The vessels are to be 480 feet long, 73 feet beam and about 26½ feet draft. Their displacement will be 13,530 tons. The engines are to be of 23,000 indicated horse-power, to develop a speed of 22½ knots. The boilers are to be one-fifth cylindrical and four-fifths tubular—viz., six tank boilers and 20 water tubes of the Babcock & Wilcox type. It is hoped that the order

for the contract vessel of this new type will come to the Clyde, but nothing is yet fixed. Clyde shipbuilders are more busy and have more work on hand than their *confrères* in the North of England, but they could do with more. B. T.

The United States Battle Ships "Connecticut" and "Louisiana."

Congress, in an act approved July 1, 1902, authorized the construction of two first-class battle ships of not more than 16,000 tons displacement, and plans for the "Connecticut" and "Louisiana" were approved by the Secretary of the Navy July 22 last. Interest attaches to these vessels as they will be the most powerful fighting machines yet constructed and also because a certain rivalry will be apparent in their building, since the first will be built at the New York Navy Yard and the other at the Newport News Shipyard. The following description of the main features of these vessels we obtain from the annual report of the chief of the Bureau of Construction and Repair:

General dimensions and features of the vessel are as follows:

Length of load water line, feet	450
Breadth, extreme, at load water line, feet	76 10-12
Displacement on trial, tons, not more than	16,000
Mean draft to bottom of keel at trial displacement, feet	24½
Gross draft, full load, feet, about	26¾
Total coal bunker capacity, tons, about	2,200
Coal carried on trial, tons	900
Feed water carried on trial, tons	66
Trial speed at sea for four hours, knots	18

The hull is to be of steel throughout, and will be fitted with docking and bilge keels.

Armament.—Main battery: 4 12-inch breech loading rifles; 8 8-inch breech loading rifles; 12 7-inch breech loading rifles.

Secondary battery: 20 3-inch, 14-pounder, rapid fire guns; 12 3-pounder semiautomatic guns; 6 1-pounder automatic guns; 2 1-pounder semiautomatic guns; 2 3-inch field pieces; 2 machine guns, caliber 0.30; 6 automatic guns, caliber 0.30.

The battery will be mounted as follows: The 12-inch guns in pairs in two electrically controlled, balanced, elliptical turrets on the center line, one forward and one aft, each with an arc of fire of about 270 degrees.

The 8-inch guns in pairs in four electrically controlled, balanced, elliptical turrets, two on each beam, at each end of the superstructure.

The 7-inch guns in broadside on pedestal mounts on the gun deck behind 7-inch armor, each gun being isolated by splinter bulkheads of nickel steel of from 1½ to 2 inches thick; forward and after guns arranged to fire right ahead and right astern, respectively; other 7-inch guns to have the usual broadside train.

The guns of the secondary battery in commanding positions, having a large arc of unobstructed fire, and protected wherever practicable.

All the 7-inch guns are so arranged that their muzzles train inside the line of the side armor, thus leaving a clear and unobstructed side when it is desired to go alongside a pier or vessel.

Armor and Similar Protection.—The hull is protected at the water line by a complete belt of armor 9 feet 3 inches wide, having a maximum thickness of 11 inches for about 200 feet amidships. Forward and aft of this the maximum thickness is 9 inches within the limits of magazines, from which points the thickness is gradually decreased to 4 inches at the stem and stern. The lower casemate armor extends to the limits of the magazine spaces and reaches from the top of the water line belt to the lower edge of the 7-inch gun ports on the main deck, and is 6 inches in thickness, the athwartship bulkheads at the ends of this casemate also being 6 inches thick. The casemate armor around the 7-inch guns on the gun deck is 7 inches thick, and the splinter bulkheads are from 1½ to 2 inches thick. The protection of 3-inch guns is nickel steel 2 inches thick. The upper casemate athwartship armor extending from the shell plating to the 12-inch barbettes is to be 7 inches thick throughout.

The 12-inch barbettes extend from the protective deck to about 4 feet above the main deck, and consist of 10 inches of armor in front and 7½ inches in the rear above the gun deck. Between the gun deck and protective deck there will be a uniform thickness of 6 inches. The barbettes will not have any special framing, the connection of the armor to the decks being sufficient. The 12-inch turrets will have a front plate 12 inches thick, rear plates 8 inches thick, and top plates 2½ inches thick. The 8-inch barbettes will be 6 inches thick in front and 4 inches thick in rear, with the upper tube 3¾ inches thick and the lower tube 3 inches thick. The 8-inch turret front plate will be 6½ inches thick, the rear plate 6 inches, and the top plates 2 inches thick.

The conning tower and shield will each be 9 inches thick, and the signal tower 6 inches thick. An armor tube 36 inches in diameter will extend from the base of the conning tower to the protective deck, and will be 6 inches thick throughout.

Teak backing of a minimum thickness of 3 inches will be fitted behind all side, athwartship and 12-inch turret armor; 2 inches of backing to be fitted behind the 8-inch turret armor; other armor will be fitted without backing.

Protective Deck.—There is a complete protective deck extending from stem to stern, the deck being flat amidships, but sloped at the sides throughout, and sloped at each end. It will be built up of 20-pound plating throughout, with nickel steel of 40 pounds on the flat and of 100 pounds on the slopes.

Ammunition.—The magazines and shell rooms are so arranged that about one-half the total supply of ammunition will be carried at each end of the ship. Magazine bulkheads adjacent to heated compartments, such as fire rooms, engine rooms and dynamo rooms, are arranged with air spaces. The ammunition for 7-inch and smaller guns will be conveyed by hoists directly from the ammunition rooms or ammunition passages to the deck on which it is required, or as near that as possible. These hoists will be driven at constant speed by an electric motor and will be arranged to deliver seven pieces per hoist per minute. The turret guns have regular turret ammunition hoists, operated by electric power, these hoists leading directly from the handling rooms or the ammunition passages to the turrets. For transporting 12-inch, 8-inch and 7-inch ammunition, trolleys and tracks will be fitted in handling rooms, passages and shell rooms.

Propelling Machinery.—The engines will be of the vertical, twin screw, four-cylinder, triple-expansion type, of a combined indicated horse-power of 16,500. The steam pressure will be 250 pounds. The stroke will be 4 feet. The ratio of high pressure to low pressure cylinder will be at least 1 to 7, and the diameters will be sufficient for the required indicated horse-power at about 120 revolutions per minute. Each engine will be located in a separate water tight compartment. There will be 12 boilers of the Babcock & Wilcox type, placed in six water tight compartments. They will have at least 1100 square feet of grate and 46,750 square feet of heating surface. There will be three funnels, each 100 feet high above the base line. The weight of all machinery and tools, stores and spare parts will be about 1500 tons.

The vessel will be lighted throughout by electricity. The electric plant will consist of eight 100-kw. steam driven generating sets, all to be of 125 volts pressure at the terminals, disposed in two separate and independent dynamo rooms.

All main compartments of the ship below the gun deck, except the coal bunkers, are to be provided with forced ventilation, there being no less than 33 blowers, with a combined capacity of not less than 104,000 cubic feet per minute. Special attention has been given to spaces subject to habitually high temperatures, such as engine rooms, fire rooms and dynamo rooms. The ventilation system will be designed to cut the minimum number of water tight bulkheads. All blowers, except forced draft blowers, are to be electrically operated.

The coal bunkers are to be arranged with satisfactory reference to the rapid and efficient supply of coal to

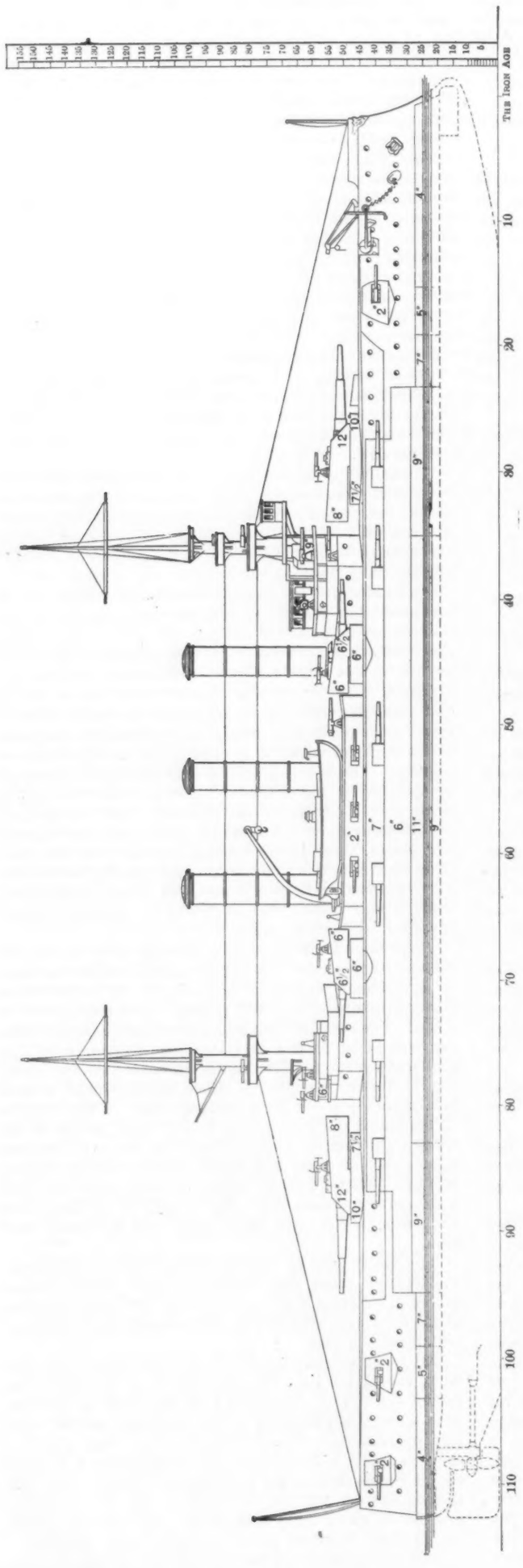


Fig. 1.—Outboard Profile.

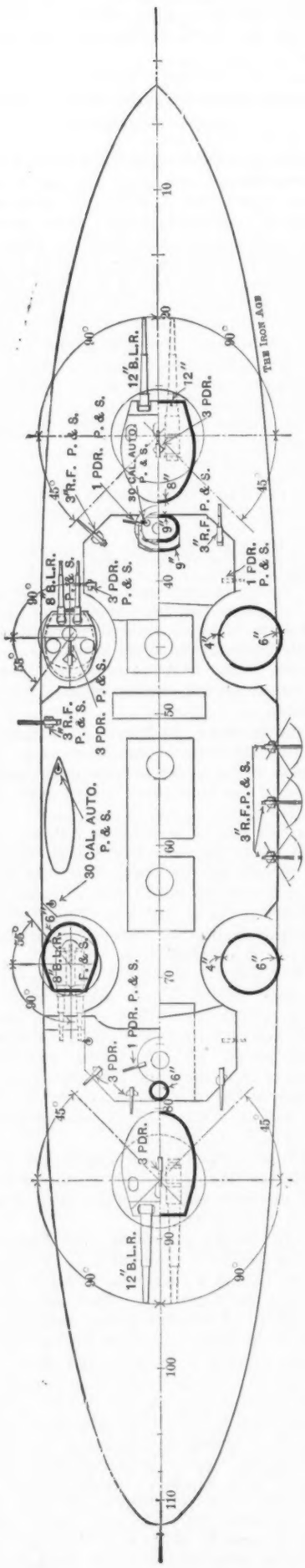


Fig. 2.—Bridge, Upper and Main Decks.

THE U. S. BATTLE SHIPS "CONNECTICUT" AND "LOUISIANA."

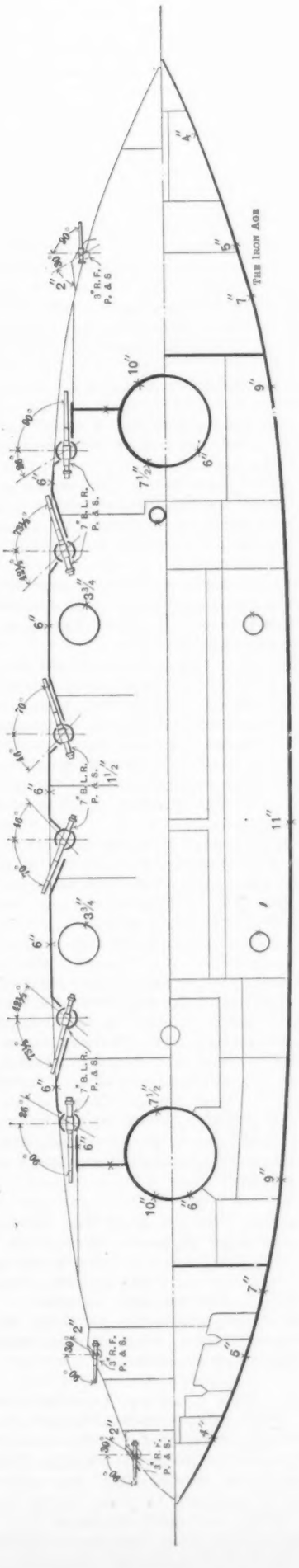


Fig. 3.—Gun and Berth Decks.

THE U. S. BATTLE SHIPS "CONNECTICUT" AND "LOUISIANA."

the fire rooms and have a maximum capacity of about 2200 tons. There are to be provided for coaling not less than six winches, 12 booms, and all necessary fixed chutes, scuttles, hatches and other openings.

The following boats will be carried, adequate provision being made for their convenient stowage and handling, 2 electrically operated boat cranes, 8 pairs of boat davits, adjustable boat chocks and all necessary fittings being provided for this purpose: 1 50-foot steam cutter, 2 36-foot steam cutters, 1 36-foot steam launch, 3 33-foot launches, 5 30-foot cutters, 2 30-foot whaleboats, 1 30-foot gig whaleboat, 1 30-foot barge, 2 20-foot dingeys, 1 16-foot dingey, 1 14-foot dingey, and 2 life rafts.

The vessel is designed as a flagship, and the arrangement of quarters provides ample accommodations for the following complement: A flag officer, a commanding officer, a chief of staff, 19 wardroom officers, 10 junior officers, 10 warrant officers, and not less than 761 men, including 60 marines.

"Connecticut" to Be Built at New York Navy Yard.

From the same report we take the following:

Congress, in the appropriation act, provided that one of the battle ships authorized by the act should be built

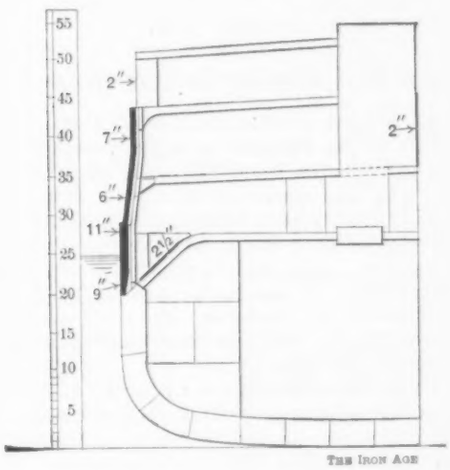


Fig. 4.—Midship Section.

in a navy yard to be designated by the Secretary of the Navy. The navy yard, New York, N. Y., having been designated by the Department, and $175,000 having been appropriated for the purpose of preparing and equipping such yard for the construction of the vessel, this bureau took immediate action upon the necessary preparations, which involved the construction of a new building slip, the purchase and erection of an electric traveling cantilever crane for handling material on the building slip, the alteration and extension of two shops (one of which was already contemplated and provided for by special appropriation), the extension of the railroad track, and the vacating of a temporary storehouse by the Bureau of Supplies and Accounts which had been located at the head of the building slip in a position required for construction work. This bureau approved the plans of the new building slip on July 12, 1902, and forwarded them to the Bureau of Yards and Docks for execution. The requisition for the electric crane was approved on July 23, 1902, and even though from the same pattern as those previously supplied by the manufacturers, the earliest possible delivery which could be secured was nine months from the date of the contract.

Plans and specification for the "Connecticut" were forwarded to the navy yard, New York, N. Y., with authority to begin the construction of the vessel, on August 11, 1902. Advertisements for the steel material to be used in the construction of the hull were issued by the Department, on this bureau's requisition, on August 1, 1902, and contracts awarded on the 12th inst. for a total of 7466 tons at a total cost of $462,691.87. The

provisions of specifications and the terms of the contract for this material have been made in such a manner as to absolutely insure the obtaining of this material at as low a price as that at which it will be supplied to private shipbuilders for the same class of vessels. The following is a synopsis of the awards, giving the number of the class, number of tons, name of article and to whom awarded, cost per pound and total cost.

1	4,206	Ship plates, Carnegie Steel Company	$0.019	$179,007.36
2	987	Nickel steel plates, Carnegie Steel Company	0.0715	158,077.92
3	1,825	Miscellaneous ship shapes,* Carnegie Steel Company	.019	78,489.60
4	188	Steel Castings, United States Steel Company	.0695 .0648	27,763.39
5	....	Miscellaneous hull rivets, American Iron & Steel Mfg. Company	.031 .06	19,353.60

* ¼ cent per pound allowed extra for cambered channels.

The authorized limit of cost of the "Connecticut," exclusive of armor and armament, of $4,212,000, has been allotted among the bureaus concerned as follows.

Construction and Repair	$2,852,000
Steam Engineering	1,100,000
Equipment	260,000

Congress also made provision in regard to keeping the cost of accounts of vessels constructed in navy yards and those built by contract, so that it will be possible, at all stages of the work, to easily compare the cost of these two battle ships.

Central Pennsylvania News.

HARRISBURG, PA., November 22, 1902.—The announcement of a proposed advance in freight rates by the railroads of the country came this week as a surprise to the steel and iron producers of Central Pennsylvania. Managers of the big steel industries in Steelton and this city are considerably exercised over the proposed increase, and say that if it is from 15 to 20 per cent. over the present rates, as has been reported, it will have a serious effect on their business. The local concerns will feel an advance on coal and coke rates most, as their longest hauls are those of fuel from the West. Raw material has been imported from England and Scotland, and has been brought here from Southern mills. Tbis, too, will add to the increase of expense, due to freight hauling. Local officials expect an advance in the price of iron and steel products if a general raise in freight rates goes into effect. The mills have, however, booked large orders for next year's delivery, and it is on these that the steel companies will lose by a freight advance, and already the Pennsylvania Steel Company have booked a large order for rails for 1903 delivery for the Philadelphia & Reading Railroad and 9000 tons of structural steel for the Pennsylvania Railroad Company. The Central Iron & Steel Company have also booked heavy orders at given prices for 1903 shipment to the Pennsylvania Railroad Company.

The coal situation in Harrisburg and Steelton has greatly improved. After a shut down of the steel producing plants and the blooming and rail mills of the Pennsylvania Steel Company for over two weeks the accumulation of coke and coal enabled the works to start full Monday morning, and the product of the week has been above the average. The Bessemer and rail departments broke all former records for production. During one 24-hour turn the Bessemer plant turned out 1290 tons of ingots. The foundries were well supplied with metal, and made good outputs. The blast furnaces are doing well, and have a small supply of coke in reserve. No. 4 Furnace, which has been out of blast for repairs, is ready to be blown in as soon as the fuel supply will warrant its operation. The shipments of the week were heavy and the car service was good. Soft coal and coke come in very slowly, and the supply of hard coal and iron is very limited.

The Harrisburg Foundry & Machine Company booked several good orders during the week, including a 500 horse-power engine for the new plant of the Eastern Steel Company, at Pottsville, Pa.; a 400 horse-power engine for the Tennessee Coal, Iron & Railroad Company, and a 600 horse-power engine for the power plant of the United Railway & Electric Company of Washington, this being the fifth order from that company.

Three stacks are in operations in Allentown, one at each of the Allentown Iron Works, Allentown Rolling Mill and Lehigh Iron & Steel Company. No. 3 blast furnace of the Crane Iron Works, Catasauqua, has been relined, the ovens enlarged and the blast engines overhauled. The furnace will be blown in December 1. The three Crane Iron Works furnaces have been changed from coke to anthracite fuel since the end of the strike. Three furnaces of the Thomas Iron Works at Hokendauqua have been placed in operation since the end of the coal strike.

The case of the Dickson Mfg. Company *vs.* the American Locomotive Company, which has been on trial all week before Judge Atchinson in the United States District Court at Scranton, has been postponed until after the Thanksgiving holidays. The suit arises out of the sale of the Dickson Company's plant to the defendant and involves $1,500,000. The case was continued to give the court time to consider the defendant's motion to non-suit.

The material for the entire frame work and most of the new defender of the America's cup will be made by Pennsylvania steel manufacturers. Part of the contracts have been already let and at least one company have begun to make the material.

The furnace of the new 19-inch mill of the Eastern Steel Company, at Pottsville, formerly known as the Fishbach Mill, was put in operation on Wednesday of this week. A new mill is to be built shortly and a coal wharf will be erected.

Work at Vesta Furnace, Marietta, was delayed for one day this week by an explosion. The furnace was laid off for some weeks on account of having no coal, but is again being operated full time.

The American Bridge Company this week completed the new $200,000 plant of the Lorain Steel Company, at Moxham, near Johnstown. The welding, planer, fitting and erecting departments will be put into operation within the next couple of weeks. Large orders for European trade have been received. Gorge P. Suppes, who has been assistant purchasing agent for the company for several years, has resigned, and has been succeeded by S. W. Griffeth.

The Norway Iron & Steel Company of York propose to increase their capital stock from $300,000 to $1,000,000. Plans have been adopted for extensive improvements to the plant. The business of the company has been doubled within the past two years.

The State has awarded contracts for steel bridges as follows: Penn Bridge Company, Beaver Falls, bridge over Big Esquimunk Creek, Wayne County, $34,889; and over Sinking Creek, Center County, $6847; York Bridge Company, Fisher's Bridge, Columbia County, $15,097, bridge over Wallenpanyuck Creek, Wayne County, $21,987; National Bridge Company, Pittsburgh, bridge over Larry's Creek, Lycoming County, $17,900; King Bridge Company, Cleveland, Nuss Bridge, Columbia County, $22,750; Nelson & Buchanan, Chambersburg, bridge over Juniata River at Millerstown, Perry County, $144,680; W. H. Gulick, Phœnixville, over Wallenpanyuck Creek, Wayne County, $16,950. S.

The American Can Company state that the volume of their business is large, all plants running full force and full time. The outlook for the future is very promising. The new factories are being rapidly completed and will be equipped with modern machinery. The smaller factories of the corporation are being merged into the large modern plants, whereby great economy may be effected in cost of production.

The Richardson Scale Company, Park Row Building, New York, announce that they have acquired the patent rights and good will of Henry Richardson for the United States, and are now prepared to sell the Richardson automatic scales in this country. The scale has been adopted as the standard by many of the British dock and harbor boards, and many thousands have been sold in Great Britain and other European countries by W. & T. Avery, Limited, Birmingham, England.

Naval Architects and Marine Engineers.

Tenth Convention.

The Society of Naval Architects and Marine Engineers met at the house of the American Society of Mechanical Engineers, New York, last Thursday and Friday. The meeting was well attended, the papers were all upon subjects of timely interest, and in many cases the discussion was of a most animated character.

The report of the secretary-treasurer showed a membership list of 843, not including those elected at this meeting, no liabilities, and total resources of over $16,000.

Clement A. Griscom, on his re-election as president for the tenth time, spoke in part as follows:

President's Address.

At the time of the foundation of this society in 1893 the American mercantile marine was still struggling against adverse conditions, largely due to national apathy in all matters affecting our maritime prestige.

It is true that the requirements of trade on our seacoast and the great lakes had stimulated the building of a large number of vessels of moderate tonnage, but the great bulk of the trans-Atlantic, and even the trans-Pacific, trade was under foreign flags, and it must still remain a matter for national regret and humiliation that such a small percentage of our foreign commerce, emanating upon our soil and controlled by our capital, is transported under our national flag. It is to be hoped that our commercial necessities and a quickened public sentiment may serve as potential influences until the mercantile marine of the United States may again attain that supremacy among the fleets of the world which was once the source of our greatest national pride.

Much has been written by distinguished naval historians demonstrating beyond reasonable doubt the vital importance of "sea power" in controlling national destinies; and, although a nation's "sea power" finds its undoubted direct expression in the size of its battle ship fleets, its potential force is quite as definitely expressed by the size of its merchant fleets—and history has frequently emphasized the truth of these almost axiomatic statements.

Therefore, while we may view with pride the development of our naval strength during the past decade, let us not as a nation forget that the foundations of true naval strength are large merchant fleets, from which the *personnel* of our battle ships can be recruited, both in peace and war; and let us always bear in mind that whatever contributes to the aggrandizement of the mercantile marine adds to our national dignity and directly increases the offensive and defensive power of the nation.

The past decade has also witnessed marvelous development in turbine motors, submarine boats, wireless telegraphy, fuel oil for ships, electric auxiliaries of all kinds and other forms of application of power, all of which have had and will continue to exercise a most important influence on the future evolution of naval and mercantile fleets.

At the time of the organization of this society only one first-class battle ship had been launched, the "Indiana," and it was not until more than two years later, on November 20, 1895, that our first first-class battle ship was commissioned for active service. There are now built, or building, 19 battle ships of the first class, and of these nine are in active service. There are now in course of construction for the navy 10 battle ships, 8 armored cruisers, 9 protected cruisers, 4 monitors, 3 gun boats, 10 torpedo boat destroyers, 6 torpedo boats and 7 submarine boats, of an aggregate displacement of 317,760 tons. Large as this may seem, it is very far from the final development which is necessary in order that we may command our proper place among the nations of the world.

The splendid achievements of our navy in the war with Spain proved the efficiency of this arm of national defense and justify its continued increase as a means, not only of national defense, but also national development, since it has been largely through the upbuilding of our navy that many industries have been developed to a degree of perfection which now permits us to compete on equal terms with the manufacturers of other countries.

Members Present.

Among those in attendance were:

Darwin Almy, president Almy Water-Tube Boiler Company, Providence, R. I.
W. Irving Babcock, president Munoz Boiler Company, New York.
Wm. Joseph Baxter, naval constructor, U. S. N., Navy Yard, Boston.
F. T. Bowles, Rear-Admiral and Chief Constructor U. S. N., Chief of the Bureau of Construction and Repair, Washington.
Charles Henry Buckelew, Ashton Valve Company, New York.
Washington L. Capps, naval constructor, U. S. N., Navy Yard, New York.
George Crouse Cook, naval architect and engineer, New York.
Henry Robert Curwen, Crescent Shipyard, Elizabeth, N. J.
William Henry Deming, Continental Iron Works, Brooklyn, N. Y.
James E. Denton, professor Exp. Mechanics, Stevens Institute of Technology, Hoboken, N. J.
Wm. D. Dickey, manager Erie Basin Dry Dock Company, New York.
Wm. A. Dobson, Wm. Cramp & Sons, Philadelphia, Pa.
F. L. Du Bosque, assistant engineer, Floating Equipment P. R. R., Jersey City, N. J.
William F. Durand, professor Naval Arch. and Marine Eng., Sibley College, Cornell University, Ithaca, N. Y.
Jarvis B. Edson, New York.
Frank L. Fernald, naval constructor, U. S. N. (retired), South Eliot, Maine.
Wm. H. Fletcher, North River Iron Works, Hoboken, N. J.
W. D. Forbes, W. D. Forbes & Co., Hoboken, N. J.
Julius Jonson, iron and brass founder, New York.
John C. Kafer, New York.
Leopold Katzenstein, mechanical engineer, New York.
Frank B. King, Washington, D. C.
Walter S. Leland, instructor, Institute of Technology, Boston, Mass.
John Loyd, mechanical engineer, New York.
Theodore Lucas, naval architect and engineer, New York.
Alexander J. Maclean, professor Naval Architecture, Webb's Academy, Fordham Heights, N. Y.
Edward A. Magee, chief engineer, U. S. N. (retired), Brooklyn, N. Y.
Spencer Miller, Lidgerwood Mfg. Company, New York.
Douglass G. Moore, president Crescent Iron Works, Elizabeth, N. J.
Lewis Nixon, manager Crescent Shipyard, Elizabeth, N. J.
Nicholas F. Palmer, Jr., manager Quintard Iron Works, New York.
Cecil H. Peabody, professor of Marine Eng. and Naval Arch., Massachusetts Institute of Technology, Boston.
Alfred H. Raynal, Bureau of Steam Eng., Navy Yard, Washington.
Charles B. Richards, professor Mechanical Engineering, Sheffield Scientific School, Yale University.
T. F. Rowland, president Continental Iron Works, New York.
Herbert C. Sadler, professor Naval Architecture, University of Michigan, Ann Arbor, Mich.
Horace See, naval architect and marine engineer, New York.
Francis Hill Stillman, proprietor the Watson-Stillman Company, New York.
Edwin A. Stevens, Hoboken, N. J.
E. Platt Stratton, manager American Shipmasters' Association, New York.
Stevenson Taylor, general manager W. & A. Fletcher Company, Hoboken, N. J.
William H. Varney, naval constructor, U. S. N., Baltimore, Md.
Frederick M. Wheeler, secretary George F. Blake Mfg. Company, New York.
Clement A. Griscom, president Int. Nav. Company, New York.
Jacob Katzenstein, superintendent L. Katzenstein & Co., New York.
James W. Kellogg, General Electric Company, Schenectady, N. Y.
Howard Pusey, Philadelphia, Pa.
Alvah Horton Sabin, chemist Edward Smith & Co., New York.
Alfred Addison Thresher, proprietor Thresher Electric Company, Dayton, Ohio.
Charles J. Weinz, H. W. Johns Mfg. Company, New York.
Henry Williams, assistant naval constructor, U. S. N., Navy Yard, New York.

Technical Training for Shipbuilders

Was by Henry S. Peitchell, president of the Massachusetts Institute of Technology. The writer outlined the course of instruction in naval architecture at the institute and said, in part:

A study of the training fitting for any branch of shipbuilding will show that the bulk of the technical preparation may be in common, whatever divergence may appear necessary to provide for specialties. The basis of such a course for a naval architect or a marine engineer will be mathematics, chemistry and physics, just

as for any engineer, using that term to designate any who apply the resources of science and art to the building of large and important structures. Both will need substantially the same training in applied mechanics and strength of materials, combined with work in the laboratory, where the student will, in addition to learning how tests are made, gain some appreciation of the nature of the materials, and will learn how to interpret the orginal work of experimenters; he may afterward safely use abstracts of results and engineers' handbooks, which shall no longer be to him a record of dry statistics, but a storehouse of living facts, which he can trace back to their origin at will. Another way of obtaining knowledge of materials is by shop work. One who has learned how to do good work in wood and iron will ever after appreciate good work when he sees it. The general educational value is even more important, for he who has learned decision from forging and accuracy from machine tool work has gained more in character than in knowledge. The elements of shop work can be most effectively taught in the mechanical laboratories of a technical school; the naval architect and the marine engineer will need to gain experience in the yard or in the engine shop (or in both), where he will learn much that is more important than methods of work; but such experience, whether taken together with a technical course or after it, is not properly a part of such a course; it is part of the training that comes with the business in which a live man never ceases to learn.

Let us add to the common stock descriptive geometry and mechanical drawing. The importance of proper fundamental training in these subjects is often underestimated for the reason that a good draftsman is seldom conscious that he is using the principles of descriptive geometry; he simply draws what he wishes to represent and thinks more of the thing than of the drawing. This is as it should be, but all teachers know the distress of a student who takes up both descriptive geometry and mechanism at the same time, and to whom a diagram or a drawing is only a strange assembly of lines and curves. And since both naval architect and marine engineer have to do with machinery, their training must include mechanism and dynamics of machines.

The course of study, upon the completion of which the degree of Master of Science is conferred, was laid out with the advice of the Bureau of Construction and Repair of the Navy Department, and seeks to add to the training already obtained at the Naval Academy those subjects which are peculiar to naval architecture, and to extend and round out that training in such a manner as will best enable a naval constructor to meet the varied and exacting demands of his official position. The course includes all the theoretical instruction in naval architecture of the regular four years' course, to which is added another year's work which has special reference to the military requirements of naval vessels. Other subjects selected from the regular course are marine engineering, steam engineering, and applied mechanics; the course is broadened and strengthened by courses in sanitation, heating and ventilation, foundations, metallurgy and metallography. A large amount of attention is given to electricity and electrical engineering, with adequate training in physical and electrical engineering laboratories; all with special reference to the use of electricity on war ships.

Adequate time is given throughout the course to war ship design, together with lectures on the construction of war ships, on armor and armament, on submarine boats, on automobile torpedoes, and other subjects relating to the building and service of war ships.

Discussion.

Rear-Admiral Bowles said that it had been the custom to send students abroad for the study of naval engineering. This paper informs the profession that we have concluded to teach at home.

W. D. Forbes said that technical training was necessary in order to make our merchant marine lead the world. Not long since, in his own shop, he had placed a technically trained young man in charge as superintendent. "The effect on men and output was marvelous. Look at the marine of the world. It is like a chart of the human body, with veins and arteries centering in the heart—England. Technical training is necessary in order to regain this trade."

Another speaker stated that we had lost the trade in wooden ships because foreign countries had studied the subject closer. We will get this back by a thorough system of education.

A valuable paper, and one in which the country at large is interested, was prepared by George W. Dickie, manager of the Union Iron Works of San Francisco.

Why It Takes So Long Time to Build and Equip a Naval Vessel for the United States.

Certain portions of the paper we quote as follows:

While it might be considered as taking somewhat of a risk to let such a cranky subject loose among the members of this society, yet we will endeavor to give it sufficient metacentric hight to keep the right side of it up, and if it be handled with great care, the building of naval vessels, even in a navy yard, will suffer no more damage from the discussion of this subject than they are likely to suffer afterward from the building of submarine torpedo boats.

In dealing with this subject the author naturally looks at it through the eyes of a contractor, which to the general public means dishonest eyes. We sometimes think that the Navy Department leans toward the public's estimate of a contractor; else why so many provisions in specifications and contracts to protect the second party, who is the stronger, against the first party, who has only his own consciousness of honesty and his honor as a shipbuilder to protect him?

In considering certain causes of delay in building naval vessels, the relationship of the superintending naval constructor, or the senior inspector of machinery, to the contractor, may, of necessity, require to be discussed, and in this connection the author desires to state that in his opinion, based on a somewhat extended actual experience, no other Government can boast of a finer staff of competent naval constructors and marine engineers, in charge of new work under construction for its navy, than that of the United States Navy Department. In fact, the ability of the superintending naval constructor or senior inspector of machinery is often quite embarrassing to the simple shipbuilder. We have often been astonished at the almost supernatural ability of the young naval constructor to acquire knowledge on subjects outside of his own profession. Let the Bureau of Construction and Repair, for instance, assume responsibility in regard to certain electrical installations on naval vessels, and in three months thereafter the naval constructors at the various yards will be further advanced in the application of electrical science to the matter in hand than the contractors' expert, who has given his whole attention for years to this special work.

Complete Design.—One of the most important causes of delay in the construction of naval vessels is the habit which has hitherto prevailed of designing such vessels while they are under construction. We do not think that it will ever be possible to so design such ships that no change will appear desirable while they are building. It is not necessary that every detail plan should be complete before the structural work begins, but the design should be complete in every particular, and the specifications should state distinctly how the actual details are to be carried out. One of the most recent specifications issued by the Navy Department requires that 253 of the most important items in construction should be built as directed, which means that at the time the specifications were written no one connected with the design for the vessel could write down distinctly just how that design was to be carried out.

Before the contract is executed the design should be so complete that all structural materials required could be ordered at once, without having to submit new plans for approval. The latest plans from the Bureau of Construction come nearer meeting this requirement than any we have had hitherto. The location and dimensions of every compartment in the vessel should be deter-

mined, and should not be subject to change. The dimensions of every armor plate should be shown, and it should be ascertained beforehand that such dimensions are within the manufacturing capacity of the armor makers. The armament should be all finally settled as to amount and location, and the type of all gun ports not only indicated, but practically worked out. The magazines should be worked out in sufficient detail to demonstrate that they will properly stow the amount of ammunition they are specified to carry. All means of handling ammunition should appear on the original design, and in capacity should correspond with the specifications. The arrangement of all machinery should be shown, with all piping and platforms, with a practical plan of getting into and out of machinery compartments. And in all such plans of machinery and boiler compartments the bulkheads should be shown their actual thickness of 12 inches, with deck beams and coamings that reduce the available space so much. This would save much time later on in rearranging machinery that must go into a space that has been reduced by the framing of its walls. Drainage and ventilation should also be fully worked out, as part of the original design. We understand that in future additions to the navy of the United States something of this kind will be attempted at the Navy Department. If this should be successfully carried out, and there is no reason why it should not be, these vessels will be several months further advanced at the date of the contract for their construction than has usually been the case, and many changes that have hitherto been necessary to meet the requirements of the design will be obviated.

Plans Changed.—A curious notion has crept into the public mind that the builders of naval vessels are very much in favor of original plans and specifications that involve them in numerous and extensive changes, and it is often claimed that the principal skill possessed by the builder of naval vessels is that of showing changes to be necessary. It is hardly necessary, before so many of these builders, to make any statement in contradiction of this fallacy, but we find that this idea prevails even among shipbuilders who have not had experience with the Navy Department. Changes are seldom proposed now by the builders, unless the work cannot be carried out without them. Nearly all changes are proposed either by the superintending constructor or the Bureau of Construction. These changes not only lose time for the builder, but in nearly every case money also. The Board on Changes, in fixing the actual cost of any change made, is not allowed to include any margin in its estimate against loss, nor the consequent loss that results from stopping work in one direction and beginning it in another direction, after perhaps several weeks' or months' discussion over the proposed change. And when the board has fixed the actual cost the builder must accept the amount whether he likes it or not; but if the Department does not like it the board must reconsider its estimates until the Department is satisfied.

Complete plans as part of the contract, that would obviate all necessity for changes, would not only save much time in construction, but would save much money for the builder as well.

The Engineering Department has fewer changes, and seldom any extra cost over the contract price. This is the result of having fewer representatives at the shipyards, and those have their duties limited to inspection, and not to design; a wise arrangement, both for the Navy Department and for the shipbuilder.

Much time would also be saved in the preparation of working details for the shops and yard if the specifications were carefully prepared from a completed design. In the hull department at present every shop or shipyard detail must be revised by the superintending constructor, not to see if it meets the requirements of the specifications or carries out in detail the design adopted, but as to whether, in his opinion, it is the kind of design that should be used; and it often goes through half a dozen or so of his subordinates, each of whom has his own opinion to express in regard to it. These men in many cases have come from the shops or the drafting rooms of the establishment whose work they now have an opportunity to criticise, and in some cases would not likely have been trusted to get out the designs they now have a chance to give their opinions upon.

In general, this system involves the builder in the making of many working plans many times over before the superintending constructor is satisfied with them. Then they may go to the bureau for final approval; but it does not follow that because these plans have been made and remade over and over again, until the superintending constructor thinks they are right, the bureau will approve them and the work go on. For at the bureau they are subjected to another process of examinations and comparisons with work from other shipyards where similar ships are in course of construction, with a good chance of being sent back for revision, with perhaps copies of plans for similar work that had been approved for a sister ship building elsewhere, and this often sends the poor shipbuilder back to the first plan he submitted to the constructor.

Where plans have to be submitted to the bureau for approval, and all plans involving any design have to be so submitted, we see no advantage in such plans being labored on sometimes for months by the superintending constructor and his staff of draftsmen, and by them returned over and over again to the builder for changes and corrections, then finally sent to the bureau for a similar process, there ending often in disapproval.

Proposed Relief.—Why should not the builder prepare his plans as he thinks will best carry out the requirements of the specifications and the adopted general designs, submit these plans to the bureau through the superintending constructor, who would give the bureau his opinion and recommendation in regard to them? These plans would reach the bureau without being so marred by changes and erasures, and we are satisfied would be as often approved by the bureau as they are now, saving much time and expense, both to the builder and to the Navy Department, for a large part of the drafting force maintained by the Bureau of Construction and Repair at the shipyards is employed on this kind of work, that is worse than useless.

If the designing work attempted by the superintending constructor and his draftsmen were abandoned and all plans as prepared by the shipbuilder submitted to the bureau with the constructor's opinion in regard to them one-half of the time consumed in getting out plans would be saved, and many months less time would be required to complete the ship. Besides, the superintending constructor would be able to devote his time to superintending construction, which would appear to be his duty if his title is correct. There should only be one naval architect responsible for the design of the vessel outside of her propelling machinery. Now we have three parties trying to do the work—the Bureau of Construction and Repair, the superintending constructor and the shipbuilder—and much time is lost in trying to harmonize the ideas of these three parties to the design. As the Bureau of Construction must finally decide, the time expended by the other two parties is in many cases simply time wasted and retards construction work on the vessel.

Another cause of delay which especially affects those shipyards situated on the Pacific Coast, and far removed from the main source of material supply, is the rigid requirements of the specifications in regard to the testing and acceptance of materials to be used in construction. It is impossible to order and have on hand every class of material that may be required, and it is quite immaterial in regard to a great deal of the material whether it really meets all of the requirements of the specifications or not. Why should steel material that is under no stress, and cannot possibly be brought under any, be tested just as carefully and rigidly as material that of necessity is always under severe strains? We have seen chocks and distance pieces, for which cast iron would be just as good as any other material, rejected and the work delayed until other material was obtained that would meet, say, a high tensile test, when its function in the structure was simply to stand a little compression. We feel sure that in regard to such questions the constructor at a navy yard where a war ship is being built will be obliged to use a good

deal more common sense than he thought necessary to fulfill his duties at a private yard.

We will be very sorry indeed if anything in this paper should be considered as a reflection on the naval constructors. We know them so well and they know us so well that we have no fear that anything we have said in this paper will be misunderstood. In every struggle the writer has had with the naval constructor it has been his misfortune to be defeated, not because his case was bad, but simply because the constructor's skill was superior to his own. But if we lost our case we never lost our friend in a tussle with the constructor.

Discussion.

In the discussion it was stated that the days of the ancient mariner method of inspection had disappeared. The shipbuilder was no longer the designer and builder combined, who worked without plans of any kind.

The main trouble now and in years past has been the lack of superintending constructors. Draftsmen of a competent type are also scarce, so that the Department is handicapped.

Changes in plan are absolutely necessary, because of the constant advances being made in material and manufactures. Inspection work on shore gives the future officer and commander of a ship a knowledge of its construction, which is of immense advantage, and which the old officers do not possess. The slow delivery of steel and in parts not in correct order to go in the ship also causes delay.

John G. Tawresey, superintending naval constructor at the Union Iron Works, in a written discussion said that all parts of a ship are not rigidly and uselessly inspected. Plans are not made over several times and are not arbitrarily changed. Changes are sometimes necessary, because suggested by work going on elsewhere. The work is generally carried on with less friction than in the merchant service.

The writer said in part: The actual time taken to construct most of our naval vessels has been prolonged by delays in obtaining armor and steel material of certain classes, and in some cases by strikes. Deducting delays of this nature from the actual time the vessels are under construction, we have left what might be called the normal time of construction in the United States. This time is undoubtedly in excess of that required by one or two of the great naval powers, but is shorter than that required by others. The author states what he considers the principal causes tending to prolong the normal time for construction. The subject is certainly one of great importance, and if the paper and discussion discover the cause and discover better methods and help those responsible for the building of our fleet, a great service will have been rendered the country and those engaged in shipbuilding.

As the superintending constructor's acts form the bulk of the subject matter of this paper and he is cited as the major cause of delay, it is necessary, if the discussion is to be profitable, that an authoritative statement be made by some one familiar with the duties and practices of superintending constructors for the United States Navy. In a paragraph referring to material the author speaks of vexatious delays, and were it not that he is a person of such wide experience and such known sound judgment I would suggest that the "vexation" has magnified most of the causes of delay mentioned in his paper. I cannot agree that more than one of them is a real and material cause of delay. In my experience I have not known anything to warrant the statements as to the superintending constructor and those employed under him doing design work; and as to the superintending constructor interfering with methods of doing work, neither statement can be based on any recent occurrence at the author's own yard, and he must be misinformed as to the work of the draftsmen under the Bureau of Construction and Repair at the shipyard. I do not know of a superintending constructor who can find time for such work.

Remarks on the New Designs of Naval Vessels

Was the title of a paper by Rear-Admiral F. T. Bowles. We take the following:

The steel structure is composed wholly of plates and shapes of commercial sizes. All shapes which have heretofore been used for naval vessels only have been discarded, having in view not only cheapening the cost of construction, but obtaining prompt deliveries of steel; the latter being a result never attained in practice when special shapes and small quantities are demanded. The number of structural shapes in the battle ships has been reduced to 24, each size of angle bar being counted as a separate shape. Channel bars are used for beams and bulkhead stiffeners.

The contract period of construction for the battle ships and armored cruisers has been placed at 42 months. It is believed that the complete and accurate state in which the plans and specifications have been issued is equivalent to a gain of six months over the time required to complete preceding vessels, and that there is a fair prospect of securing the completion of these vessels within the contract period, a result which has never yet been attained.

The problem of the naval architect should be to produce the best military unit for the least amount of money, and it remains for those who command naval vessels to say what limit of military power shall be placed upon the individual unit of the fleet. A distinguished foreigner recently asked why our battle ships were so large, or of so great displacement, and was told in answer that the conditions of our service seemed to make it necessary for our battle ships to go anywhere and be ready to fight when they get there. While our recent battle ships are undoubtedly large, the "Virginia" class of five vessels being 14,980 tons normal displacement and the "Connecticut" class 16,000 tons normal displacement, there are unquestionably great advantages obtained in the individual power of the battle ship, as compared with its smaller predecessors. On the other hand, it is undoubtedly well for naval officers to consider whether the necessary military power could not be secured with about the same battery and armor protection, but less speed and coal capacity.

It should not be forgotten, too, that our naval designers are handicapped when it comes to very large ships by restrictions of draft more severe than those of many foreign powers.

Comparisons.—In making comparisons to show the advantages of increase in size, they should be made between ships which are tactically comparable—that is, of practically the same speed and whose motive power and battery are of substantially equally modern design. A comparison in figures and percentages easy of comprehension, to show the effect of the increase in size of our own battle ships, can be made between the "Alabama" and "Maine" classes (our most recently completed classes), considered together as being practically about 12,000 tons displacement, and the "Connecticut" class of 16,000 tons. The cost of the "Maine" and "Alabama" classes, complete, is about $6,000,000 each. The cost of the "Connecticut" class is about $7,500,000 each. The displacement has been increased 33 per cent. in passing from the "Maine" and "Alabama" to the "Connecticut." The cost of four "Connecticuts" will equal the cost of five "Maines" and "Alabamas." The weight devoted to battery and ammunition in the "Maine" and "Alabama" is 1003 tons, and in the "Connecticut" 1340 tons. Therefore, by increasing the displacement of the "Maine" and "Alabama" by 33 per cent. there has been a corresponding increase in the weight of armament carried. The weight of the discharge of one round from all the guns of the "Maine" and "Alabama," above 6-pounders, is 5312 pounds, whereas the weight of the discharge of one round from all guns above 6-pounders on the "Connecticut" is 7856 pounds, or an increase of 47.9 per cent. Therefore, for an increase of one-third in size there has been a gain of nearly one-half in effective battery power. Thus, if the battery power of the "Maine" and "Alabama" be considered unity, that of the "Connecticut" will be one and a half; and for $30,000,000 four "Connecticuts" can be built, with a battery power of six, and five "Maines" and "Alabamas," with a battery power of five. In the

case of the "Maine" and "Alabama" the weight devoted to armor protection amounted to 2770 tons, and on the "Connecticut" to 3992 tons, thus showing an increase in protection of 44 per cent. for an increase in size of 33 per cent.

These illustrations of the enormous gain in offensive and defensive power of these vessels, corresponding to the increase in size, are well-known parallels of the greater cargo efficiency of the larger vessels in the merchant service, which is due to the fact that the larger vessel requires a less proportion of hull and machinery weights than the smaller for the same results in strength and speed.

If similar comparisons were made of the "Connecticut" with the "Oregon" class there would appear an increase in displacement of 55 per cent., an increase in the weight of armament and ammunition of 56 per cent., an increase in protection of 36 per cent., but an increase in the weight of battery discharge per round of only 10½ per cent. But these comparisons are of little force on account of the low speed of the "Oregon," the inefficient gun mountings as compared with that of more modern vessels, and the inadequate armor protection. It should be remarked that the arrangement of the battery of the "Oregon" class is probably unsurpassed, and that it has furnished a type followed by other designers than our own.

A similar comparison with the "Kearsarge" and "Kentucky," larger vessels of practically 12,000 tons displacement, shows an increase of 14 per cent. in the weight of armament and ammunition, 34 per cent. in protection, and 20 per cent. in the weight of discharge of battery per round. The "Kearsarge" is an excellent illustration of what can be accomplished in large battery power, moderate speed (16 knots) and small coal supply. Discussions of the "Kearsarge" and "Kentucky" based upon normal displacement are, however, somewhat misleading, owing to the fact that certain circumstances of their design necessitated reducing the coal carried on normal draft to 410 tons.

The advantages of the increase in size and length of the "Connecticut" are clearly shown with reference to the elements of speed and power. Model basin trials show that at a speed of 18 knots the power required for the "Connecticut" is about 6 per cent. less than that required for the "Maine;" whereas, at 19 knots the power required for the "Connecticut" is nearly 50 per cent. less than that for the "Maine."

The normal displacement of the "Tennessee" class is 14,500 tons, an increase of 6 per cent. over that of the "Pennsylvania" class of six vessels now building of 13,680 tons. Certain features of the new designs have permitted this increase to be almost wholly devoted to armament and armor, thereby producing at slight additional cost very much greater military power. The addition to the weight of guns and ammunition carried amounts to 29.7 per cent. over that on the "Pennsylvania" class, and produces an increase in the weight of one discharge of the battery amounting to 47.4 per cent. The increase in the weight of protection carried amounts to 30 per cent. of that on the "Pennsylvania" class, and is devoted to an increase in the armor on the turrets and the redoubts of the 10-inch guns, which replace the 8-inch guns in the forward and after turrets on the "Pennsylvania" class, and to an increased area of side armor, affording ample protection to the magazines and the supply of ammunition to all guns, and also to a complete subdivision of the main battery by armor bulkheads.

The estimated speed of the "Tennessee" class is 22 knots, the same as the designed speed of the nine cruisers now building of the "Pennsylvania" and "St. Louis" classes, and will be effected without an increase in machinery weights.

These vessels will be exceeded about a knot in speed by a few foreign armored cruisers, but if their designs had been made upon the prime requisite of speed superior to all vessels of this category it would have been necessary to sacrifice the battery and protection now assigned which enables them to present a heavy preponderance of battle power over any armored cruisers yet designed elsewhere, and also enables them to deal on occasion with a large proportion of existing battle ships.

The paper then presents particulars of the "Connecticut" and "Louisiana" and the cruisers "Tennessee" and "Washington." The first class is described elsewhere in this issue.

Lieutenant-Commander A. P. Niblack presented a paper on

The Tactics of the Gun,

from which we take the following:

The difference between the tactical values of battle ships and of cruisers, torpedo boats, submarines and rams, are those of degree rather than of kind, for each merely chooses some weapon or some quality of the battle ship, and sacrifices everything else to it. The special tactics suited to each are dictated by the battle ships. Cruisers, torpedo boats and rams must have speed to avoid encountering them unwillingly or to deliver their blow in the shortest time, so as to escape as much gun fire as possible. Submarines must be invisible.

It is the function of the ram and of the torpedo to penetrate the under water body of a ship, and breaking down its water tight subdivisions, or striking it in a vital point such as a magazine or boiler, to destroy it. It is the function of the gun to put out of action the battery and *personnel*, but as long as a ship retains her motive power, steering gear and her *personnel* other than that at the battery the gun is almost powerless to destroy. To be more explicit, it is only by luck or by indirection that a modern battle ship can sink another by gun fire alone. We need not in the future expect to set ships on fire by gun fire, as at Santiago or Manila, and, indeed, we have a long way to go before we can expect to achieve victories over our next adversary. This is a warning and not a prophecy.

The individual gun is the unit of offense, in one sense, but the combined fire of as many guns as possible, directed according to a definite scheme, by means of well organized fire control, alone means victory. The key to modern fleet actions is concentration of gun fire. To achieve this we must install our guns properly, and we must of all things train our *personnel*. Fleet formations should be based on gun fire, and in battle we should limit tactical movements to those which least disturb it.

The object of all tactical maneuvers or movements of a fleet previous to or in a fleet engagement should be:

To get and keep the enemy within a close effective range.

To endeavor to get a superior position in order to mask some of his fire or increase the effect of your own.

To hold an advantage gained, or, losing it, to maneuver for a fresh one.

To avoid waste of ammunition.

To get out of a position of disadvantage or one in which a move of the enemy may threaten to place you.

To concentrate gun fire on certain ships of the enemy in order to reduce the tactical efficiency of all his ships by crippling one or more.

But of all things to deliver a rapid crushing fire at the earliest posible moment, thereby injuring at once his initiative and increasing your own offensive power in a geometrical ratio as you destroy his.

With modern battle ships the installation of pairs of heavy guns in the ends of ships and the introduction of the ram and the torpedo have changed naval tactics. Bow and stern fire is now a little less than 30 per cent. of each broadside fire, instead of about 5 per cent., as in the sailing ship days.

Torpedo Tubes Left Out.—I am personally mentally incapable of understanding the reasoning which has led the Board of Construction, in the Navy Department, to leave under water discharge torpedo tubes out of the recently designed battle ships and armored cruisers. (We have them only in the "Maine," "Missouri" and "Ohio," of all our ships in the navy.) Every one regards above water torpedo tubes, in such ships, even behind armor, as rather dangerous, but with, as I believe, the very best and safest under water discharge

system, and with either the new modified Obry or the Kaselowsky attachment fitted to torpedoes, it is inconceivable that any one can argue against under water tubes for modern battle ships. In fact, a ship is not a battle ship unless she has them. I have personally seen under water discharge abroad with our type of tube, and the modified Obry gear, with 1000 yards run, in this country, and I have as much faith in the accuracy and reliability of the torpedo as I have in the 12-inch gun. Modern fleet tactics demand the torpedo. Its mere presence on board limits the range at which gun fire may be used in single ship actions or in fleet engagements, and just when the torpedo is beginning its development seems a poor time to dispense with it.

Gun Fire and Target Practice.—Few people realize the horrible destructiveness of modern gun fire. Our fleet at Santiago accomplished what it did with less than 4 per cent. of hits, and at that time our navy had the reputation of having the best gunners in the world. Since then both ordnance and gunnery have been almost revolutionized, so much so that guns and methods good enough for 1898 are an invitation to-day to disastrous and bitter defeat. To illustrate how gunnery has improved and how terrible must be the hail of projectiles in a modern fleet engagement, let us briefly notice the recent progress made in the British Navy in the matter of target practice. Let us take first the 6-inch guns, as shown by the annual prize firing contest for 1901.

Each ship steamed at a speed of 12 knots and fired for two minutes with each 6-inch gun, firing one gun at a time, at a target 20 feet long and 16 feet high, at a distance of nearly a statute mile. As published in the British press and verified by official reports, in 1901 the average of 48 British ships was nearly two hits per gun per minute. The best 15 of the 48 made from two to four hits per gun per minute, but the best individual record was a string of eight shots and eight hits in one minute.

In the study and formulation of the principles of tactics and strategy we may rest assured that the naval war college at Newport is alive to its responsibilities, and we may now confidently look forward to the day when a general staff will put the principles into execution in case of the appeal to arms to which this country seems to have the habit and for which it is apparently always unprepared. We cannot afford next time to trust to luck and an obliging enemy. There is a healthy realization in the *personnel* of our navy to-day of our unpreparedness and of the fact that other powers know it. We know very well where we stand in the matter of target practice. We need during the coming year $2,000,000 in ordnance and $120,000 in gunnery exercise, instead of the usual $500,000 and $12,000, respectively. Gun fire is everything.

Discussion.

Rear-Admiral Bowles said that when the board of expert officers and designers decided that the submerged torpedo tube was a mistake "I am willing as a constructor to leave it out."

Another speaker said that too much stress was laid on the use of the ram. He considered it obsolete and thought that it would never be used. Both ships would probably go down. A disabling fire, that would put out of action a certain portion of the *personnel*, would disable the ship. The shock would be too great. It would be like a blow to the human body—struck in only one place, the whole body is disabled.

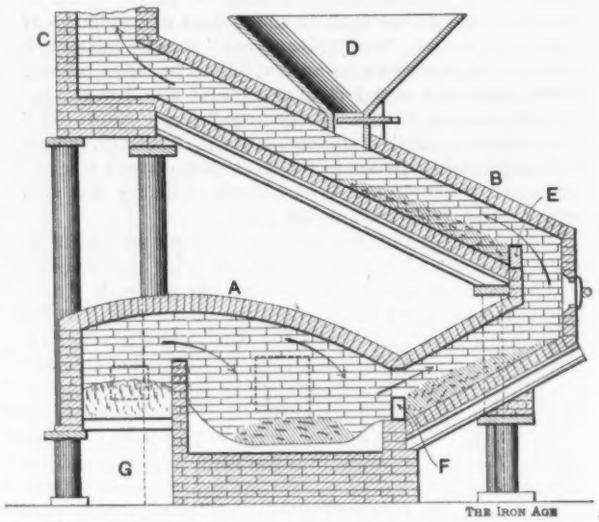
We shall present abstracts of some of the other papers read at the meeting in a later issue.

McAdamite Metal.—The McAdamite Metal Company of Canada, Limited, St. John, N. B., manufacturers of McAdamite, a new bearing metal for which they have the Canadian rights, have decided to amalgamate with the McAdamite Company of America. The metal is based upon aluminum, and possesses the many special features of that metal. It is claimed that while it has the strength of a high melting metal like steel, it melts half way between steel and tin, thus enabling it to be easily cast, perfectly finished. It can be tooled and machined with the utmost ease. William A. McAdam of Brooklyn, N. Y., the discoverer of McAdamite, in connection with others, has developed automatic machinery for utilizing the metal, and it is expected that within a short time rods, bars, angles, channels, tubing and castings will be manufactured in marketable quantities.

The Kent Reverberatory Puddling Furnace.

The Empire Patent Puddling Furnace Company have been incorporated with a capital of $125,000 to exploit a new puddling furnace, designed by William Kent of Struthers, Ohio, superintendent of the Youngstown Iron, Sheet & Tube Company. The furnace is arranged so as to charge the hearth with metal, which has already been brought to a high temperature, without exposing the melting chamber to cold air. The heat of the escaping gases is utilized in heating the charge before it reaches the chamber. The construction will be understood from the accompanying sectional drawing, which shows the furnace as adapted to the use of borings, turnings or "swarth."

The melting chamber A, as usual, is partly partitioned off from the fire chamber G. Generally the flue B leads at once to the stack, which would be placed at the right in the drawing. The melting chamber has a door through which the ball of metal after working is removed, and through which, as usually constructed, the charge is introduced to be heated and worked, being generally shoveled in. By that method of charging the chamber is cooled while it is being charged and also by the cold metal coming in contact with it. The heating and sud-



THE KENT REVERBERATORY PUDDLING FURNACE.

den cooling of A are injurious to the brick work, and in a very short time crack and destroy the lining. The flue in the Kent furnace may be built of brick laid on I-beams supported by the columns, as shown. In the flue is placed the hopper D, through which the metal is introduced. It falls on the bottom of the inclined flue B, which, being made of quite smooth brick, allows the charge to slide down at the proper time into the lower flue branch by the withdrawal of the gate stop or charge block E. The charge again is allowed to slide down into the hearth by sliding out the gate F at the proper time. Thus the charge is subjected to the heat of the escaping flame beforehand, and it is introduced into the hearth already heated nearly to the melting point. The charge is introduced without any interruption of the draft or the cooling of any of the parts, and it may be regulated at pleasure, both in volume and temperature.

When the ball of puddle iron is removed to be worked under the hammers or in the rolls or the squeezers a fresh charge is introduced at once and without interruption or cooling. While the metal is in the inclined flues charcoal may be mixed with it, which being slowly oxidized and heated together with the metal the iron absorbs carbon and produces charcoal iron. The furnace is particularly valuable for this function.

The New Chicago Air Compressor.

A new type of air compressor, built at the Franklin (Pa.) Air Compressor Works of the Chicago Pneumatic Tool Company, is here illustrated. This machine represents the latest product in this exacting field and is designed to meet the growing demand for higher efficiency in air compression that naturally attends the steadily increasing adoption of pneumatic machinery in all branches of industry. It is known as the Class C. S. C. pattern, designed for a delivery air pressure of 100 pounds per square inch, with a steam pressure of 100 to 150 pounds. The compressor has low pressure steam cylinder 31 inches in diameter, high pressure steam cylinder 20 inches in diameter, low pressure air cylinder 28 inches in diameter and high pressure air cylinder 16½ inches in diameter, all cylinders being 24-inches stroke. The capacity of the compresor is 1710 cubic feet of free air per minute when operated at 100 revolutions, or 2052 cubic feet at 120 revolutions.

In design the frames follow the most approved Corliss construction and are of exceptional strength, to withstand extreme strains without producing mechanical distress. The steam and air cylinders are tied tandem to each other with heavy tie rods, and are rigidly supported by a sole plate, which extends beneath all four cylinders. The pillow blocks have extra broad pedestals and all frames are planed perfectly true on the bottom, assuring a perfect alignment. All cylinders are of extra close grain iron, with appropriate thickness for reboring, and are bored true and parallel. The steam and air pistons are of the solid type, cored hollow to avoid unnecessary weight, and are provided with snap rings of special iron carefully fitted to place. They have no followers or bolts, thus avoiding liability of accident. The stuffing boxes are of ample depth, and the piston rods are of steel, turned true and polished.

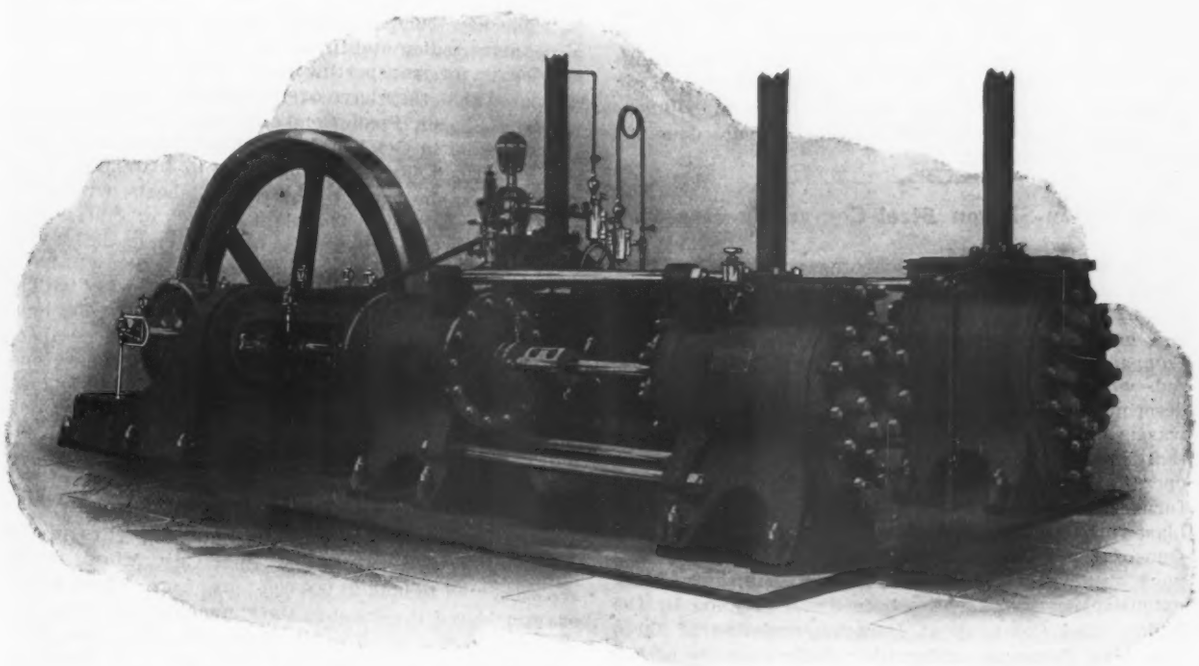
The air cylinders and cylinder heads are water jacketed. Provision is made for a circulation of cold water the entire length of the cylinder, the water passing also through the heads, its cooling effect being especially concentrated around the discharge valves, which naturally sustain all of the heat due to compression and friction that has not been eliminated by the water jacket during the actual process of compression.

A novel feature, the value of which as a safeguard cannot be overestimated, is an outside water connection for conducting the circulation of water between air cylinder and cylinder head, excluding the possibility of serious accident through the water entering the interior of the cylinder should the gasket between the cylinder and head become ineffective.

The bearings are exceptionally large and well proportioned. The main bearings are provided with removable shell boxes, and only phosphor bronze and babbitt metal are used. All bearings are adjustable for wear, with ample provision for oiling. The steam valves are balanced slide valves, and are provided with Meyer independent adjustable cut off. All valves have provision for readjustment when required by wear.

The air inlet and discharge valves are of the poppet type, placed in the cylinder heads from the outside, and immediately accessible for adjustment or repair without removing the cylinder heads. The valve, valve stem and head are forged in one piece, entirely avoiding the use of flange nuts, jam nuts, split pins or other contrivances intended to serve as a head for the stem. A feature of more than ordinary importance embodied in this valve is the fact that the valve seat is a part entirely separate from the cylinder proper and may be removed, replaced or renewed whenever occasion requires. In most forms of air compressors employing poppet valves the valve seat forms an integral part of the cylinder head, affording no opportunity for renewal when it becomes worn The valve seats are of bronze and the springs of steel, light enough to minimize resistance in opening, yet strong enough to promptly seat the valve in closing. The proportion of valve area to cylinder area is exceptionally liberal, enabling the cylinder to fill freely at each stroke, without volumetric loss or impaired efficiency due to the wire drawing effect of insufficient valve area. The cylinder flanges are recessed to prevent the valves from falling into the cylinders, thereby avoiding the necessity of a guard plate and the consequent clearance loss resulting from its use.

The cranks are of disk pattern, made from charcoal iron. The shafts and crank pins are forced to their places, the former being keyed and the latter riveted, especial care being exerted to have the shaft and pins parallel. The crank pins are of special ground steel. The crank shafts are made from best hammered machinery steel, accurately turned and finished. The connecting rods are forged steel. The boxes are adjustable for wear. The guides are bored, and crossheads are provided with babbitted shoes at the top and bottom with wedge adjustment for taking up wear.



THE NEW CHICAGO AIR COMPRESSOR.

A combined speed and pressure regulating governor is provided, having a connection to the air receiver, and regulates the steam supply to the compressor to suit the air consumption, maintaining a constant unvaried air pressure, even though the demand be intermittent. Working in combination with this governor is a speed governor for regulating the speed of the engine.

The intercooler furnished with this type of compressor consists of a set of tubes encircled by a steel shell, into the heads of which the tubes are fitted, suitable provision being made for expansion and contraction. A constant circulation of cold water is maintained through the tubes, and the compressed air from the initial compressing cylinder enters the intercooler on one side, and after thorough distribution and contact with the tubes discharges from the other side, passing to the next compressing stage. Adequate provision is made for readily cleaning the interior of the intercooler, and the tubes, being of composition metal, do not rust or become foul.

Complete provision is made for automatic oiling, sight feed lubricators being furnished for steam and air cylinders, centrifugal oilers for crank pin bearings and oil cups for all wearing parts. The steam and air cylinders have indicator connections, and indicator diagrams are taken under the exact working conditions.

This type of compressor is built in three sizes, ranging in capacity from 500 to 2000 cubic feet of free air per minute, and is also built with simple steam cylinders for plants where the available steam pressure does not warrant compounding.

The Union-Sharon Steel Companies Merger.

The past week announcement was made in Pittsburgh of a consolidation of the entire interests of the Union Steel Company of Pittsburgh, with rod, wire and nail mills at Donora, Pa., and the Sharon Steel Company, with blast furnace, open hearth steel works, rod, wire and nail mills at Sharon, Pa. A complete description of the plant of the Sharon Steel Company was printed in *The Iron Age* of July 4, 1901, but since that time the company have considerably enlarged their operations by the addition of five 50-ton open hearth furnaces and have started the building of two more blast furnaces, each with a daily capacity of 400 tons. One of these furnaces is pretty well under way and work on the other was started a short time since. Very extensive new works have been under erection by the Union Steel Company at Donora, consisting of three new blast furnaces, each with a daily capacity of 500 tons, and an open hearth steel plant to contain 12 50-ton furnaces. These additions have been under way for some time and the Union Steel Company expect to be making pig iron and steel at the new works soon after the first of the year.

The Union Steel Company and Sharon Steel Company have been the largest individual makers of rods, wire and wire nails outside of the American Steel & Wire Company, and both have very complete and modern plants. A consolidation of these two large interests has been hinted at more or less in the last year, but it is said the actual negotiations for a merger of the two interests occupied less than a week's time until the consolidation was effected. It is understood that extensive plans are under way for the building of other large works, and probably the taking over of one or two other companies now engaged in the manufacture of rods, wire products, sheets and pipe. However, nothing official as regards this has been given out, nor will it be for some time. The merger of these two interests is the largest consolidation that has taken place in the steel trade since the formation of the United States Steel Corporation in February, 1901.

The new corporation will be known as the Union Steel Company. The officers chosen are: A. W. Mellon, president; W. H. Donner and John Stevenson, Jr., vice-presidents, and former State Senator William Flinn, chairman of the Board of Directors. The merger agreement was signed by William Flinn, John Stevenson, Jr., and George W. Darr, for the Sharon Steel Company, and by A. W. Mellon, R. B. Mellon and W. H. Donner, for the Union Steel Company.

The new corporation will have their own furnaces and mills of all kinds, their own extensive ore fields in Minnesota, their own coal mines and coke fields, their own limestone quarries; in short, everything of their own that is found to be necessary or even useful in the steel business of modern times. To complete the plans for engaging in the manufacture of steel on a scale second only to the great United States Steel Corporation, the new Union Steel Company will build probably their own railroad, a distance of 200 miles, from the lakes to the Connellsville coke region. They will be dependent on no one company or any number of companies for material used in manufacture. After papers had been signed the following official statement was issued on Thursday evening, November 20:

"Late this evening the papers were signed agreeing to the consolidation of the Union Steel Company works at Donora, owned by the Mellon interests and W. H. Donner, and the Sharon Steel Company's interests, at South Sharon, control of which is owned by John Stevenson, Jr., William Flinn, George W. Darr and others.

"The new company own valuable properties in the Mesaba ore region and in the Old Range ore region, and also boats for transporting the ore on the lakes. It is estimated that they have over 70,000,000 tons of ore.

"The Sharon Steel Company were incorporated in Pennsylvania in October, 1899, with a capital of $2,000,000, which has since been increased to $6,000,000. They make billets, sheet and tin bars, rods, sheets, wire, wire nails, skelp and pipe. The plant consists of a blast furnace in operation, with a capacity of 500 tons daily; two blast furnaces in course of construction, which will have a capacity of 800 tons; 13 open hearth furnaces with a capacity of 1400 tons; one blooming mill of 2000 tons capacity; one billet mill and one bar mill with a capacity of 1000 tons; two rod mills of 450 tons capacity; one wire mill of 350 tons capacity; one nail mill of 350 tons capacity; one nail mill producing 3500 kegs daily; one tin mill, made up of 20 furnaces with a combined capacity of 280 tons; one sheet mill with a capacity of 100 tons; one pipe mill of 350 tons capacity, and 212 by-product coke ovens of a capacity of 1200 tons daily.

"The company have extensive ore properties in the old Mesaba range, located at Buhl City, Minn., which are estimated to hold 21,000,000 tons of ore. These mines are considered the finest in the range, and are conservatively estimated to be worth $7,000,000. They also have 5000 acres of coal lands and 4000 acres of limestone property in Mercer County, Pa., and 1500 acres of coke property at Masontown, Fayette County.

"The bonded debt of the company amounts to $3,250,000. This consists of $1,500,000 first mortgage 5's on the plant proper, $500,000 Sharon Sheet Steel Company 5's and $1,250,000 Sharon Coal & Coke Company 5's. For the two latter issues the company act as guarantors, the companies being auxiliary concerns. Officers of the company are: President, George W. Darr; vice-president, John Stevenson, Jr., and treasurer, D. Adams. The Board of Directors consists of John Stevenson, Jr., J. P. Whitla, John Fahnline, W. H. Lewis, Sharon; William Flinn, George H. Flinn, John K. Bryden, Peter Shields, Pittsburgh, and George W. Darr, New York. At the Sharon plant over 2500 men are employed.

"The Union Steel Company are a Pennsylvania corporation, having received their charter in November, 1899. The plant is located at Donora, about 35 miles from Pittsburgh. The company manufacture steel rods, wire, wire nails, wire fencing and other like products. In 1901 the company acquired several iron ore properties in the Lake Superior region, and organized the Donora Mining Company to operate them. The company have a capital of $1,000,000, which is nominal, as fully $7,000,000 has been expended on the company's plant and ore properties. In the latter alone $2,000,000 is said to be invested, their prospective holdings of ore amounting to probably 20,000,000 tons. The company also own

3000 acres of coking property in Fayette County. The officers are: President, W. H. Donner; vice-president, A. W. Mellon; treasurer, R. B. Mellon, all of Pittsburgh. The directory comprises A. W. Mellon, R. B. Mellon and W. H. Donner.

"Upon the merger of the two companies the capital stock of the organization will be increased to between $40,000,000 and $50,000,000, as has been stated, a proportion of which will be sold to new interests and reserved for working capital or still further acquisitions. Stockholders of the Sharon Steel Company will get for each share of their stock, of which the par value is $100, the equivalent of about $240. Most of this will be made up in stock of the new company and the balance in cash. This will make a total payment of close to $15,000,000."

Lake Iron Ore Matters.

DULUTH, MINN., November 22, 1902.—Shipments from upper lake ports continue at a remarkably fast pace. It is evident that November forwardings of ore will be unexpectedly large and that the year's total will just that much more exceed expectations. It will be well into December before lake harbors will begin to ice up and probably ore will move till ice is making. The intention of large interests to maintain large reserve supplies of ore is responsible for the heavy fall shipments down the lakes.

The Sharon and Union Ore Properties.

Ore mines controlled by the Sharon and Union steel companies of Pennsylvania make a very respectable total and are of considerable importance just now. The Sharon Steel Company own the stock of the Sharon Ore Company, operating a mine at Buhl, Mesaba range. This is the only property so far held by the company. It is owned in fee, having been secured for $150,000 before the immense value of the property was understood. The mine is an open pit and the milling system is in vogue. Ore extends east and west ¼ mile and more than that north and south. There may perhaps be 40,000,000 tons in the deposit, which has hardly been fully explored as yet. It is largely non-Bessemer and would not have been regarded as high grade two years ago, though now very satisfactory. The Union Steel Company own the stock of the Donora Mining Company, who have a long time option for purchase or lease of the Volunteer mine at Palmoer, Marquette range, and of several adjacent properties of promise. These are non-Bessemer and run from about 55 to 62 per cent. iron. The Volunteer, including 110,000 tons mined by the Donora Company this year, has shipped in all 1,260,000 tons. On the Mesaba range the company have recently bought the Penobscot mine, of 10,000,000 tons Bessemer ore of good quality; own about 2,500,000 tons of natural stock pile a few miles west of the Penobscot and several million tons more on the east end of the range, largely Bessemer. They have also been doing a large exploring business and have operated six to ten drills for a year or more. They have found some ore in addition to the east end find, but not much has been taken for operation. The company are well fortified in ore supplies of good grade for a long time. In addition to their one large mine the Sharon Steel Company have long time contracts with the Minnesota Iron Company, under which they will have a large annual tonnage of Mesaba Bessemers for some time to come.

The Marquette and Menominee Ranges.

On the Marquette range the Oliver Iron Mining Company are to make a steam shovel proposition out of their Moore, a lean high silicon property. There is a surface of 15 to 20 feet and this is now being stripped for mining another year. There is not a mine on the range where the steam shovel is used other than in stock piles, but at the Moore is the largest deposit of ore found on that range so close to the surface. They have been mining all summer but slowly and the product is not great. The Breitung Hematite Company have completed their three-compartment shaft and are hoisting some ore. They will develop during the winter and expect to have a large deposit shown up by another year. A complete machinery equipment is being ordered. The mine is on lands of the Breitung estate that were partially explored by the Cleveland Cliffs Company under the supposition that their Pioneer Iron Company leases would carry the properties. When the courts ended this anticipation the lands were taken up by the fee holders; considerable exploration has been done since and is being carried forward now.

Indications are that Bessemer ore finds may possibly be made in the territory north of the Mansfield mine, Menominee range, which is now the only Bessemer property in that region. The Thomas Furnace Company of Milwaukee and the Bird Iron Company are exploring in this territory and the first named are getting some Bessemer ore, while the latter expect to reach it. They are both on what seems to be the Mansfield formation. Kimball mine, which was leased to Corrigan, McKinney & Co. some time ago and has been unwatered, will be developed for shipping another year. The mine was opened in 1888, but was never a shipper. The Pewabic Company, who have been exploring at Beechwood for a year, have stopped without finding anything and have moved their drills elsewhere.

The Mesaba Range.

On the Mesaba range a large amount of stripping will be done this winter. The Biwabik Mining Company expect to make a new through cut in the deposit, on a deeper level than that now in use, and to strip to the north of the present pit. Adjoining it the Duluth mine is to be stripped for new work. At Eveleth the Adams mine will be extensively stripped for open pit mining in a portion of the immense ore body there and about 150,000 yards of earth will be removed during the winter. Stripping operations on the Fayal, also at Eveleth, will continue indefinitely. At Virginia several stripping operations will be carried on and it is possible that a new mine will be opened northeast of the village for the Minnesota Iron Company. On westerly from Virginia it is possible that the Steubenville Iron Works will recommence their stripping operations, suddenly stopped last summer. At Mountain Iron the pit is to be widened and cleaned up considerably. West of there, in 58-19, day and night crews are at work on the Kinney stripping for the Republic Iron & Steel Company, and the milling pit of the Sharon mine is to be materially extended before another spring. West of that town, in 58-20, several ore bodies are to be stripped during the winter or are to have their present stripping extended. At Hibbing the Burt is being stripped on a very large scale for the Minnesota Iron Company. This work will last several years. The Penobscot will be stripped. At Leetonia mine, and probably at Sweeney also, there will be a large shipping moved next year. These two properties join each other. One is a Sellwood mine, the other a Union Steel property. At Stevenson a large amount is to be taken off this winter in anticipation of maintaining the enormous shipments of this season. About 500,000 yards will be let on contract and the company will move 300,000 more, but not all this will be moved for several years. Still west of there the Hawkins is being stripped and the work will last a long time, though the present contract is not large.

Several shafts will be sunk on the Mesaba during this winter at deep mines, but the trend of ideas is so strongly toward stripping and open pit mining that mines which a few years ago would have been opened underground are now to be made surface, and it is not improbable that a depth of 100 feet of overburden will not long prove insuperable to the strippers, this depending in very large measure, of course, on the thickness of ore below.

J. D. Gilchrist, manager of mines for the Colorado Fuel & Iron Company, has been on the Mesaba range this week looking for men to manage new properties to be opened in Wyoming and Colorado. Some of the mines of the company resemble Mesaba range conditions, especially those about Sunrise, Wyo., where the steam shovel is used for mining, and the older range is educating men not only for this, but for many new fields near and far. D. E. W.

National Founders' Association.

Sixth Annual Convention.

The most important action taken by the National Founders' Association at the sixth annual convention, held in Detroit, Mich., on November 19 and 20, is contained in the following resolution, which, in large measure, is the net result, not only of the deliberations of the convention, but of the efforts of the officers, the Administrative Council and the Conference Committee during the past year. The resolution was passed unanimously on the closing day of the session:

Whereas, At a joint conference held between representatives of the Iron Molders' Union of North America and the National Founders' Association, in the city of Detroit, October 8, 9, 10 and 11, 1902, the following joint resolutions were unanimously adopted:

Whereas, It is the conviction of those who have given the subject of the relations of the employer and employee the greatest amount of study that the most equitable way to adjust such questions as may arise to disturb said relations is by the joint discussion of the issues involved by those directly interested or their representatives; and,

Whereas, It would further appear that when decisions have been arrived at the interests of all parties are more effectually conserved by recording such adjustments in the form of agreements that define as far as may be possible the positions of all the interested parties; and,

Whereas, In the course of their relations the Iron Molders' Union and the National Founders' Association have entered into a number of said agreements, some of which are not similar in all of their terms; and,

Whereas, Said variations have not been productive of the best results, but have on the contrary promoted a feeling of uncertainty; and,

Whereas, There are a number of localities and many members of both organizations not at this time affected by any agreement whatever; therefore be it

Resolved, That it is the opinion of this joint conference, representing the Iron Molders' Union of North America and the National Founders' Association, that the time has arrived when in its judgment the purposes of the two bodies will be best promoted by the formulation of a general form of agreement, national in its character, for each class of foundries, and that as far as possible it should cover all the points arising in foundries of the class covered by said agreement, and be subject to such modification in detail as may be necessary to meet the needs and conditions prevailing in the districts into which the membership of the Iron Molders' Union and the National Founders' Association may properly be divided, all such modifications to be of general application in the district for which they have been formulated.

Now, therefore, be it *Resolved*, By this association that the above resolutions are hereby indorsed, and be it further

Resolved, That this convention, having in view the adoption of a yearly national agreement covering the principles upon which the foundries shall be conducted, the members are requested and the Administrative Council of this association is hereby instructed not to make any more local agreements.

Resolved, That this association in favoring the making of a yearly national agreement with the Iron Molders' Union of North America does so only on condition that any such agreement must embody equitable conditions relating to apprentices, restriction of output, set day's work, limitation on a man's earning capacity, abolishing of fines imposed on molders for the purpose of limiting an individual molder's production, the right of an employer to operate molding machines or any other foundry appliance in accordance with his best judgment, and to maintain equitable piece work and premium systems, the abolition of a flat minimum wage rate and the establishment of a differential wage rate for molders.

Resolved, It is the sense of this convention that the establishment of a nine-hour day is a local and not a national issue, and that any demand that may be made upon members of this association for a change in the hours of a working day shall be considered and acted upon in accordance with the New York Agreement. And, further,

That no agreement shall be entered into favoring a shorter work day unless the conditions recited in the preceding resolution are made a part thereof. Finally, be it

Resolved, That this convention indorses the action of its Conference Committee in refusing to discuss the nine-hour question except upon the conditions above enumerated.

Subjects Considered.

It will be noted that the resolutions, with their preliminary clauses, embrace in concrete form the ideas of the members of the association upon the ten subjects of discussion which had prominently been brought before the members for consideration prior to the convention. The subjects are as follows:

1. Should the association take any stand in reference to the desirability of continuing or discontinuing the local agreements that have been made in some places between foundry employers and their molders or core makers?

2. Is it desirable that the association should instruct its Administrative Council to endeavor to arrange satisfactory national agreements with either molders or core makers, provided the organizations referred to were to change several restrictions that violate natural laws?

3. What should be the policy of the association toward the effort of labor organizations to restrict the number of apprentices?

4. What should be the policy of the association with reference to the effort of labor organizations to abolish piece work?

5. What should be the association's policy with reference to the continuous limitation of output on the part of labor organizations?

6. What should the association's policy be with reference to the operation of molding machines?

7. Is it desirable that the association should acquiesce in any way in a movement to reduce the hours of labor?

8. What should be the association's policy in the case of attempts on the part of labor organizations to prevent non-union men from going to work?

9. What policy should be pursued when an effort is made to prevent a member of this association, who has satisfactory arrangements with his employees, and with whom there is no quarrel, from being prevented from making work for some foundry concern with whom some labor organization is having a dispute?

10. What policy should be pursued to encourage foundry concerns who are not members of this association to become affiliated with it?

The election of officers and members of the eight district committees and the consideration of changes in the constitution and by-laws of the association were the other important features of the work of the convention. But incidentally many interesting points were dwelt upon and the discussion brought out the sentiment of the members on various questions distinctly and forcibly, especially upon the the expediency of a national agreement with the Iron Molders' Union as contained in the above resolutions. The possibility of a universal nine-hour day was the most pregnant subject before the convention.

THE OPENING SESSION.

At the opening session on Wednesday, November 19, a committee of three on Order of Business was appointed by the chairman, consisting of C. N. Covell, Brooklyn; O. P. Briggs, Minneapolis, and Stanley G. Flagg, Philadelphia. A committee of two was also appointed to audit the books of the treasurer—namely, J. H. Webster, Cleveland, and H. M. Leland, Detroit.

President's Report.

The annual address of the president, W. D. Sargent, was conspicuous for the broad minded views taken, for the clearness and fairness with which the founders' relations to their employees were set forth and for the keen insight into the needs of the association and the course necessary to increase the usefulness of the organization. Following is the greater part of the address, which contained a strong tribute to Commissioner John A. Penton and some other matters relating strictly to organization work:

To the Members of the National Founders' Association:

At the close of a year of great activity and prosperity, both to our members individually and to our association, it would seem fitting to take this opportunity to place a proper estimate upon the position which this association occupies, both with regard to the employees of its members and to its members themselves. In these days of labor agitation and unrest, we may profitably make the effort to look calmly and dispassionately upon the condition in which we find ourselves. It is certain that evolution is in progress; that many and rapid changes have taken place; that with the great strides made in general business organization the foundry industry has been considerably affected, and it now seems necessary to give some consideration to the results which have been brought about.

Starting with the supposition that the interests of employers and employees were opposed to each other, before the organization of this association most of the foundrymen of this country and most of their employees kept peace because neither the one nor the other felt itself strong enough to go to war. The foundry owner, when forced to by the superior strength of his employees, recognized his shop as a union shop and submitted to union rule because he had to. The molder accepted piece work, allowed the introduction of any number of apprentices, and did not seek to interfere with the wage scale prevalent in the shop and district in which he worked until the union organizer appeared,

who made himself strong enough to enforce his demands. Victory or mastery for either side was gained by force—that is, so far as the relations of the union molders and their employers were concerned.

To-day we can look back and say that with the organization of the National Founders' Association a period of education began and that the net result of five years' progress is nothing more nor less than this: the recognition by our members, and by many of their employees, of a few simple truths—and the determination of the real points at issue between employer and employee, union and nonunion—the truths which we recognize being such as require no argument and appeal forcibly to the intelligence of every man possessing common sense, common honesty and common courage, to borrow the words of President Roosevelt. Employer and employee alike to-day recognize the truth of the statement that their interests are largely mutual; that the causes operating to the disadvantage of the one

F. T. TOWNE, President National Founders' Association.

are nearly sure to cause injury to the other, and that enlightened self interest demands a proper consideration each for the welfare of the other.

Starting with this truth as a basis, we can proceed to assert that the employee must refrain from any attempt at restriction of output, at the same time that his employer is careful to use only fair means in increasing his output. We can see that the apprentice rules which prevent our young men from learning the molders' trade should be eliminated, just as any other artificial restriction must be. We can see that the right of the employer to give employment, and of the molder to seek employment, must be free and untrammeled, and that merit must be the basis upon which the scale of wages is based. We can further see that the conditions under which the molder works deserve the careful study of every employer and that anything that looks toward improving these conditions must receive his attention.

The evolution then that has taken place is from a state of unstable equilibrium maintained by force to a state which depends more and more upon the recognition by both employer and employee of the grand truths which underlie all industrial relations. We have now reached a period in which the only excuse for strife is willful refusal to be guided by the truths which are so frequently obscured and which are always brought to light by the patient efforts of the leaders in the movement which is taking place.

The members of the National Founders' Association employ a large number of molders who are not members of the Iron Molders' Union, and they have a plain duty to perform to this latter class; it is to safeguard their interests in adjusting the relations between our association and the Iron Molders' Union—and it has been the policy of our association to have this object always before us. We have issued many hundreds of cards to those molders not members of the union who have faithfully served the interests of their employers, and we believe that this pledge of the fairness of our association and of our recognition of the great truth which is involved is highly appreciated by the recipients of these cards.

We would say to this class of our employees, as we recently said to the representatives of the union employees, that we hold open for free discussion all points involved in the adjustment of our relations with our employees; that we seek to educate, and to be educated, in the settlement of these great problems; that we wish to obtain only what is fair and right and based upon truth, and that whenever we can be shown that our demands exceed these limits—or that the demands of our employees fall within these limits—we shall gladly be governed by this, the only test.

It has been the privilege of your president to participate in several important conferences between officers of the Iron Molders' Union and of this organization, and it is exceedingly pleasant to remember that our conferees have gone into each meeting asking themselves whether their position in regard to the questions under discussion was fair, was right and was based upon truth; and that we have never sought in any way to take advantage of the conferees on the opposite side by the concealment or obscurement of any phase of the questions under discussion. We have always been guided by a desire to bring about agreements based upon truth and to this end have always been open to the arguments of the opposite side.

Last month we met the representatives of the Iron Molders' Union in a very important conference, and through four days discussed and debated important phases of our relations, with a net result at the end of that time of the education of every participant to a higher plane of thought in connection with all the matters in dispute.

It is most gratifying to assert to you that the desire now exists, not only upon our part, but upon the part of the Iron Molders' Union, to agree upon the disputed points—to recognize the great truths which exist, and to co-operate with each other to bring about stable conditions and permanent conditions. Since this desire does exist there can be but little doubt that the agreement is bound to come, incomplete perhaps in its first form, but sure to be perfected as time goes on and the process of education advances.

When we think that this result depends not only upon the officers of our organization and the representatives of the molders, but upon the faithful efforts of each of our members to keep in touch with the progressive thought and the developments brought about by the efforts of the officers of the association, we must conclude that one member who refuses to be guided by the principles that have been enunciated does untold harm to the association, just as the molders of any district who refuse to be guided by the agreements and advice of their officers diminish vastly the power of the union to advance the interests of its members at large; and that the successful adoption and execution of fair and just agreements depend upon the education of the membership at large of the National Founders' Association and of their employees to the recognition of the truth, and upon nothing else whatever; that our troubles will continue so long as any considerable por-

tion of our membership, or their employees, do not place a proper value upon such a recognition.

It appears, then, that the campaign of education so well begun must be vigorously pushed, and that the practical work of continuing it, intrusted as it is to the organization which we have developed, has been proven by our experience a success, and that we are warranted in planting our feet firmly on the platform, of which the principal planks are mutual recognition of rights by employer and employee, freedom from restriction upon output and employment of apprentices, and the payment of wages based upon merit.

These truths have been plainly put to the representatives of the Iron Molders' Union. They are almost the only points at issue, and when they are recognized in the settlement of each individual dispute we shall have for both sides an infallible guide.

The year now closed has seen the end of the Chicago molders' strike and the commencement of molders' strikes at Birmingham and Cleveland, while the association has successfully resisted the demands of the coremakers at Pittsburgh and Milwaukee.

Your commissioner will give you the history of these disturbances; it is only necessary to say here that our association has in every instance used every means in its power to protect the rights of its members.

The demands of employees have been many and urgent. We have willingly granted everything that was justifiable, but to those that were deemed unreasonable we have offered a most determined resistance.

The organization plan of our association has been subjected to certain changes during the past year as a result of the action taken at our last annual meeting, by which a method of conducting the detail executive work of the association designed to relieve the president, vice-president and chairman of the district committees of a large amount of detail work heretofore performed was adopted. It is hardly necessary for me to advise our membership that the new plan, with certain modifications adopted by the Administrative Council, has been successful in practical operation.

In concluding this report the president desires to return personal thanks to the officers, the Administrative Council and the members who have contributed to make his relations with the association of so pleasant a nature, and to bespeak for himself the charitable judgment and for the Administrative Council the thanks of our members at large. The systematic and businesslike methods that have been adopted by your council have, it is believed, been productive of most beneficial results, while the extremely important work of the special conference committees has been cheerfully undertaken by members who could ill afford the time.

The Commissioner's Report.

The report of the commissioner, John A. Penton, was a voluminous document, going into the history of the organization from its inception and covering the work thus far accomplished, especially reviewing the occurrences of the past year in detail. After some general preliminary remarks Mr. Penton said:

The employee's privilege to organize can be no longer questioned. His right in this country to affiliate himself with any society, political, religious or sociological, is not disputed, but in conceding that there are many employers who feel that there the rights of the employee terminate. If we are determined to secure for ourselves those rights that are justly ours, and which in this free country are really guaranteed to the citizen, we must be as willing, always, to concede to the employee such rights as are undoubtedly his.

This brings to the surface a question that has been more productive of discussion and differences of opinion than any other during the past—viz., What should be the policy of this association toward the union's claim of right to be recognized as an authority or power in the shop?

There is a sharp difference between a committee of an employer's own employees calling upon him to discuss any proposition they may desire to submit and a committee from a local union, even if all his own employees, who may desire to be regarded as being clothed with a certain measure of authority from an organization outside the establishment. There have been and are members of our association who feel that a member should be at all times willing to meet and discuss with a committtee of his own employees any question that might be suggested for his consideration, but that a question of the union or matters pertaining to union methods, ideas and policies should not be made a portion of the discussion of the character referred to.

The difficulty encountered, and which inspires no doubt the opposition to the committee as an influential or official factor, comes from the fact that the committee, when once established, becomes the official mouthpiece of not only other employees but of all the members of the local union in any effort they may put forth to establish what are known and regarded as union conditions. It is, therefore, more the committee as the embodiment or personification of these conditions than anything else that inspires the aversion to what is known so familiarly as the "Shop Committee."

WM. D. SARGENT, Ex-President National Founders' Association.

COMPENSATION.

With our foundry employee, practically the beginning and the ending, the underlying thought, the spirit, the desire and justification for his organization is compensation for his labor. All other considerations and questions that arise so frequently, and which, in the estimation of the average foundryman, are really of the first importance, are to the foundry employee second always to the matter of compensation.

Take, for instance, the vital question of apprentices. The sole thought behind the opposition to either the elimination of all restriction on this subject or the modification of its unreasonable, unjust and untenable provisions is that, were the union to comply with the desire of the foundrymen in that respect, their doing so would be taken advantage of by foundrymen generally, to the extent that not only would a greater number of molders be made than the requirements of the business render necessary, but wherever possible apprentices would be used to an unlimited extent to the exclusion of skilled mechanics, who are members of the union, and thus the whole question reverts again to the earning power of the member and the influence upon that earning power exercised by the apprentice.

RATIO OF APPRENTICES.

It is needless to revert here to the fact that the officers of the International Molders' Union would seem to favor a modification of the present ratio and that it was urged by the president of the union in his report at the last convention. The fact remains that it is just as it was years ago, when conditions were different, and the Molders' Union can never expect and never will receive the degree of consideration at the hands of this association or its officers that it might expect until it has materially modified its position on this point in the direction of fair play toward those from whom it continually complains of injustice.

MOLDING MACHINE.

Then again there is the question of the molding machine, with its attendant complications. The union is averse to the molding machine being operated by others than members of its organization, irrespective of the degree of skill required, for the sole reason again that, later on, the introduction of a percentage of unskilled men who could operate these machines successfully and satisfactorily would work to the disadvantage of the union's members. They have, therefore, recently declared that hereafter any one "who works at molding" in any capacity or who operates a machine in any way is eligible for membership in their organization, irrespective of the skill or experience required or the provisions of their own constitution and by-laws hitherto governing that point.

The same general feeling upon their part is responsible for the numberless restrictions and limitations that so hamper the happiness of the foundrymen and cause such never ending turmoil.

MINIMUM WAGE RATE.

With the view, therefore, to obtaining stable conditions by minimizing uncertainty as to the wage rate, your officers have during the past few years complied with the earnest desire of the union, and joined in agreements, or permitted our members to join in agreements, in many localities, temporarily conceding a minimum wage rate. This has been done in the hope that the representations of the union's officers as to the advantages to be derived would be fully realized. After giving the local agreement feature and the minimum rate each a full test, it is the unanimous judgment of your officers that in all respects they fail to bring to the foundry trade that measure of satisfaction and good feeling between employer and employee so essential to the best and most equitable results.

It was felt that perhaps the settling of wage conditions for a year, in any one locality, would remove the chief cause of dissension and that, as a result of the more friendly relations anticipated, there would be an absence of differences of opinion from other causes.

Concerning the minimum wage rate, as we all understand the term, it is unnecessary to say very much here, as practically every member of the association would appear to be of the same mind, and sooner or later a serious modification of the system will become imperative. Over 96 per cent. of the replies received from our members to a recent circular letter asking for an expression of opinion on this subject were outspoken and emphatic against the minimum wage rate, coupled with the union restriction as regards apprentices and what might be regarded as unskilled molders, and in the face of such unanimity upon the proposition it is easy to see that the day is not far distant when the foundrymen will feel that their wishes in this respect must receive serious consideration.

THE TORONTO CONVENTION.

The officers of the National Founders' Association had been led to believe that some relief from these conditions could be expected after the Toronto Convention of the Iron Molders' Union, but while, as we have pointed out, the president of the union recommended a modification of the union's position upon the apprentice ratio, and stated in the most emphatic way that modern foundry conditions justified the foundrymen in feeling that upon certain classes of work they had the unqualified right to employ a class of labor that would rank below the skilled molder when the question of efficiency is concerned, nothing apparently was decided upon that would furnish the needed relief in any direction.

As time goes on a large percentage of our members appear to be a unit in feeling that a more satisfactory state of affairs must eventually result.

REMOVAL OF RESTRICTIONS.

We do not find foundrymen generally so averse to paying what would be regarded as a fair rate, but the accompanying conditions as regards apprentices, inability to employ without friction molders at a lower rate on a plain class of castings or specialty castings, the limitation of output, objections to laborers operating molding machines, even on the most simple castings, the union's opposition to piece work and other limitations and restrictions create and perpetuate a feeling of antagonism that really, after all, costs the molders of this country a great deal of money in the long run.

At the last conference your committee especially

ISAAC W. FRANK, Vice-President National Founders' Association.

emphasized the fact that in its judgment the removal of all these embarrassments on the part of the local and national unions would eventually result to the advantage rather than the disadvantage of the employee and destroy much of the natural hostility that now hampers both parties.

UNION MORE CONCILIATORY.

It must be admitted that, contrary to the generally accepted thought of employers, we have found, during the past year especially, a much more reasonable and fair spirit shown by the officers of the national union, and while it is greatly to be regretted that in so many cases they seem to regard as essential to their ultimate success that the old fashioned method of striking should be resorted to, yet it is and has been our belief that, in time, it will dawn upon them that in all the strikes of the past four years against the National Founders' Association or its members no one has been the gainer. A feeling of antagonism is being maintained, the opposition of our members to unions and unionism is being constantly fanned into a flame, which in the end no one claims will be an advantage to the wage earner.

THE STRIKE OBSOLETE.

The strike has from time immemorial been the one great universal weapon of the trades union, and while

it may have been or may be justifiable in individual cases, when the employer fails to show a proper appreciation of what is right, it is and ought to be out of place and unjustifiable in the case of a member of an association such as this aims to be.

It is understood in the first place that we stand ready to recognize and do recognize the growing tendency of the times with reference to trades unionism. We meet with their representatives constantly to discuss and endeavor to adjust the innumerable cases arising in all parts of the country, and we extend to their representatives at all times a degree of cordial recognition that would have been impossible a few years ago, and which would not exist to-day, as far as foundry employees are concerned, were it not for this organization.

We think that the National Founders' Association, in the position it occupies on this question, is camping upon advanced ground, and your officers earnestly deplore the tendency of those responsible for the position of the union to resort to the antique and disastrous method of the strike to secure more favorable conditions.

The net result of the strikes inaugurated against the members of this association has been disastrous to the strikers, disastrous to those against whom conducted, and of direct advantage only to those who have been employed to take the strikers' places. In addition, strikes have served to perpetuate a feeling of hostility on both sides that prevents co-operation and mutual understanding, and not until the union has radically changed its position on this point will it, or its officers and leaders, be respected or treated as they appear to desire. There are instances in plenty to prove that when strikes have been avoided, even when advised or ordered, and the men have remained at work matters have eventually adjusted themselves to the satisfaction of all parties. Strikes have never settled and never will settle these disputes. The only cure is going to be a mutual feeling of increased respect, which will forever be impossible when unfair or forcible methods are attempted.

THE CORE MAKERS.

During the past year our membership, as will be noted elsewhere, has been inconvenienced upon several occasions by strikes inaugurated by core makers. This latter organization has given evidence of such glaring irresponsibility that your officers have declined to have any dealings with it of a national character, and while we have been sufferers to a slight extent, owing to the entire absence of authority, discipline or judgment on the part of its officers or of the organization itself, we should certainly have suffered to a greater degree had a different policy been pursued.

The commissioner then outlined 156 of the most important cases wherein difficulties had been encountered during the last term for the enlightenment of the members at large.

Treasurer's Report.

John R. Russel, treasurer, read his report, showing receipts and expenditures during the year.

H. W. Hoyt, Chicago, called the attention of the convention to the unusually valuable services of Treasurer Russel, who on many occasions had taken the financial burdens of the association upon his own shoulders unsolicited, thus enabling the important work of the association to be carried on without hindrance, and suggested that a vote of thanks be tendered Mr. Russel by the association. This being put in the form of a motion, was carried unanimously.

Committee Announcements.

At this juncture H. N. Covell, as chairman of the Committee on Order of Business, announced to the convention that an invitation had been extended to the association by the Detroit foundrymen to attend a smoker at the Hotel Cadillac at 9.30 Thursday evening.

By a vote of the convention a Press Committee of three was appointed by the chair, as follows: John A. Penton, Willis Brown and Walter Perry.

The president announced that the Nominating Committee, of which P. W. Gates, Chicago, was chairman, would meet immediately after the morning session, after which the convention adjourned until 2 p.m.

Secretary's Report.

Upon reassembling in the afternoon the secretary's report was presented, showing that a great effort had been made during the year to increase the membership of the association, over 300 founders in the United States and Canada having been invited to join the association, and the result of the endeavor, making allowances for changes in the previous memberships, consolidations, withdrawals, &c., was a net gain of 117, a total membership of 494, representing 527 foundry plants. Members have been secured in the States of Virginia, Georgia, Alabama and Louisiana, as well as in the Provinces of Ontario and Quebec, which sections had previously been without representation. The total number of employees working in the shops of members was placed at 27,389, including 5837 apprentices; 10,527 floor molders, 4220 journeymen bench molders and 2378 journeymen core molders, are working in the foundries of the members. The secretary reviewed in detail the work of the Administrative Council during the year, calling attention to the fact that after the last convention the council had created the office of commissioner, and the commissioner's services had been employed in the adjustment of labor difficulties that had occurred in largely increased numbers throughout the year. He gave in detail the handling of the funds of the association in connection with the strikes of the molders at Chicago and the core molders at Milwaukee, Pittsburgh and Birmingham, and the establishment of association headquarters in the cities where strikes had occurred. He also entered into a history of the issuing of National Founders' Association certificates to molders who were entitled to the association's consideration for services rendered during times of difficulty. It was noted that these certificates are now in great demand among non-union molders. Attention was called to the thorough manner in which all such work is carried on by the association, copies of each agreement and other important documents being held by the secretary always ready in case of need. Upon motion the report was referred to the Administrative Council for publication in whole or in part. The reports of the other officers were, upon motion, treated in the same manner.

Report of Conference Committee.

A. C. Pessano, chairman of the Conference Committee which had been appointed at the previous meeting of the convention, was called upon by the president to give an outline of the work of the committee, consisting of W. D. Sargent, F. T. Towne, R. D. Reed and the commissioner. Chairman Pessano made a verbal report, going over the ground fully and carefully, and the resolutions which resulted from the conferences—and which had also been given in the commissioner's report—were read to the convention. After some preliminary remarks in regard to the attitude of the National Founders' Association Mr. Pessano detailed the results of the national conference which was held at New York City in May last with the officers of the Iron Molders' Union, which conference was held previous to the iron molders' convention that the officers of the union might be prepared to explain to the members of the Iron Molders' Union the exact attitude of the National Founders' Association. The New York conference was followed by a similar meeting at Detroit on October 8, 9, 10 and 11, of which quite a full report was given in *The Iron Age* of last week.

Net Result of the Conference.

The acknowledgment of the union officials that they were unable to act upon the suggestions or demands of the association was taken as evidence of weakness on the part of union officials, and it was regretted that so little had been accomplished in tangible results from the four days' conference. However, as Chairman Pessano explained, much had been gained from an educational standpoint, and in fact the aim of the committee had been to place clearly before the union the ideas of the association upon the advisability—indeed, the necessity—of the formulation of a yearly national agreement.

Before the close of the conference the representatives of the union again urged very strongly upon the association representatives the need for action with reference to the establishment of a shorter work day. The National Founders' committee, however, replied that they refused to discuss a shorter day, except in connection with the national agreement covering the differential wage rate and the other vital questions which had been presented by the committee.

Discussion of Report.

After concluding his report, Chairman Pessano suggested that the action taken by the committee in regard to the proposed yearly agreement should be ratified by the association; upon which Mr. Covell moved that the report of the Conference Committee, as presented by Chairman Pessano, be adopted.

The discussion which followed this motion was general and extended throughout the remainder of the morning session, Chairman Pessano being called upon again and again to make explanations upon various points which apparently had not been made clear. The one subject which seemed uppermost in the minds of the members was the suggestion or demand of the union for a nine-hour day. There was apparently a very strong sentiment against making any such concession, and many members took particular pains to show wherein a shorter work day would prove detrimental to the interests of the founders. Some of the remarks were spirited and were received with applause.

Another question which was brought up in the discussion was the giving of a bond by the union and by the Founders' Association to bind any agreement that was subsequently entered into by the two organizations.

Information was asked on various points, but the applications were not always responded to with satisfaction. As one member expressed it, the ideas of the union resolved themselves into a demand for "higher wages and less work," which was received with applause. As the convention seemed to be drifting into the consideration of irrelevant questions, the threshing over of which, while interesting and of value in understanding the temper of the association, was unproductive of tangible results, it was moved by Mr. Covell that the chair be instructed to appoint a committee of three to draft suitable resolutions covering the report of Chairman Pessano and to present the same to the convention at 9 a.m. on the following morning. This was carried without a dissenting voice.

Just prior to adjournment, for the information of the convention a rising vote was taken to learn the relative position of members of the association in regard to the system of working hours at the various foundries. It was found that of the members then present 110 were working on the ten-hour system and 32 on the basis of less than ten hours.

SECOND DAY'S SESSION.

Upon the reassembling of the convention on Thursday morning Chairman Pessano, who had prepared a report in accordance with the action of the convention of the previous day, offered the resolution with its preambles which proved to be the most important action taken by the convention. The resolution is given at the beginning of this report.

The attention of the convention was called to the fact that in preparing the resolution the clause favoring the security of an agreement by bond had not been inserted, and as this seemed desirable to some of the members an amendment was proposed. Mr. Covell, who was followed by Mr. Hoyt of the Allis-Chalmers Company in the same tenor, called attention to the fact that the question of a bond was involved with that of incorporation, and that, while the giving of a bond was highly desirable, it was at the present time impracticable. Mr. Hoyt especially alluded to the fact that experience had shown that an agreement broken by either party had always proved a distinct disadvantage to the delinquent organization. It was suggested that the questions of bond and incorporation of the union and of the Foundry Association should be left to the discretion of the Administrative Council, as they could well be trusted with the difficult task. Mr. Hoyt's remarks were followed by applause and the withdrawal of the amendment.

General Discussion.

Then followed a lengthy discussion of the various subjects brought up in the resolution, it being pointed out by the chairman that the resolution before the house embodied nearly all of the important questions which had been thought desirable to discuss at the convention. He therefore called upon each member who had any remarks to make to do so before the question was put before the house; that no other opportunity would be offered for such discussion. One of the most notable features brought out by the remarks of the various members was that there had been a marked change of sentiment over night, a more conciliatory spirit pervading the association, it being recognized that if the union would grant the requests of the association as presented by the Conference Committee, they could afford to take up the question of the nine-hour day with the hope of satisfactory agreements, it being recognized that mutual concessions would be necessary to preserve harmonious relations.

ANTONIO C. PESSANO, Chairman Conference Committee, National Founders' Association.

One of the members called attention that the ratio of apprenticeship of 1 to 8 and one additional for the shop was too small for the best interest of the founders, and that the present lack of skilled labor was in large measure due to the limitation of apprenticeship. In his opinion, one apprentice to every six molders and a term of three years instead of four years' service would bring much better results. After a lengthy discussion there were loud calls for the previous question, and the resolution was carried unanimously.

Changes in Constitution and By-Laws.

Changes in the constitution and by-laws of the association, as recommended by the Special Committee consisting of F. T. Towne, P. W. Gates and Geo. Q. Thornton in the report presented to the Administrative Council at the Windsor Hotel, Montreal, Quebec, August 5 and 6, were then presented to the convention.

Chairman Towne explained that according to the constitution it would be necessary to submit the proposed changes to the membership for a letter ballot, there not being enough of the members present to act upon the question, it requiring a two-thirds vote of the association to change the constitution.

Auditing Committee.

The committee which had been appointed to audit the books of the treasurer reported favorably, all the accounts being found correct with vouchers attached to all bills. The report, upon motion, was accepted and filed, and the committee discharged; upon which the convention adjourned until 2.30 p.m.

Certificate of Membership.

Upon the reassembling of the convention in the afternoon of Thursday, November 20, Chairman Covell of the Committee on Order of Business presented a resolution that a certificate of membership of appropriate design be prepared and engraved under the supervision of the secretary, and signed by the president and commissioner of the association and sent to each member of the association. This was carried without a dissenting voice.

To Operate Molding Machines.

Although the subject of molding machines is supposed to have been covered by the resolution offered by Chairman Pessano, some members of the convention thought that the sentiment of the association should be expressed more strongly by an independent resolution, which resulted in the offering of the following, which was adopted:

Resolved, That it be the sense of this convention that it is the absolute right of a member of this association to operate a molding machine or any mechanical device to further molding in such manner as best serves his interests, and that the strength and resources of this association, as provided for by the constitution and by-laws, be and are hereby pledged to the support of a member making such use of a molding machine.

A resolution was offered thanking Chairman Pessano for the able manner in which he had conducted the conference with the representatives of the Iron Molders' Union, and the Administrative Council was instructed to appoint Mr. Pessano on the Conference Committee, which is to meet the officers of the Iron Molders' Union in January next. This resolution was carried unanimously.

A Special Assessment.

To enable the Administrative Council to carry on the work of the association thoroughly and systematically, the association gave its sanction to the levying of a special assessment based upon the number of molders employed by each founder. The sentiment was expressed by a Cincinnati member that each member of the association who had contributed to the work had received in return three to four fold, and, in his opinion, the Administrative Council should have the right to make assessments whenever in its opinion occasion should arise. The motion was carried unanimously.

A Foundry School.

There being no further business before the convention C. M. Power was given the privilege of the floor to suggest to the convention the advisability of a trade foundry school. The views of Mr. Power seemed to meet with the hearty approval of the members of the convention, but no action was taken or contemplated.

A resolution thanking the Detroit Foundrymen's Association for the hospitality extended to the members of the convention and for the entertainment afforded by the smoker on Thursday night was carried amid applause.

Election of Officers.

Chairman P. W. Gates of the Nominating Committee presented the name of Fred. T. Towne of the Yale & Towne Mfg. Company, Stamford, Conn., for president. In presenting the nomination Mr. Gates paid a high compliment to the ability and integrity of Mr. Towne, and was followed by Mr. Hoyt in a similar strain. Mr. Towne was elected unanimously.

The president appointed Messrs. Gates and Hoyt a committee to conduct Mr. Towne to the chair. Upon taking the gavel Mr. Towne, in an appropriate manner, thanked the convention for the honor conferred upon him and expressed his appreciation of the words of Messrs. Gates and Hoyt. Further he said:

Address of F. T. Towne.

No one who gives any thought to the industrial conditions of the country to-day can help but be impressed with the rapid growth and vigor of trades unionism, and the manner in which it is extending its influence into all branches of industry and of the power which they possess by virtue of their united action and singleness of purpose. That power unrestrained and unrestricted inevitably leads to imposing conditions upon the employer of labor that are intolerable. How to restrict and restrain that power is the problem that confronts the manufacturers of this country to-day and the members of the National Founders' Association.

The National Founders' Association offers to the foundrymen of the country a form of protection which, single handed, they are unable to obtain. By virtue of its strength, unreasonable demands of labor organizations may be held in check, and the right of the employer to conduct his business in such a manner as he may see fit is assured, provided he keeps within the limits of justice and fairness. That the necessity for such organization exists we are all ready to admit. But there is a surprising unwillingness (as there has been in the past, and there seems to be always, unwillingness) on the part of the manufacturers of the country to join in any earnest efforts in the work of forwarding the cause. They are too prone to leave it to the other fellow, and as a result the work is often left undone; and yet we have before us in the unions and particularly the Iron Molders' Union an example of energy and organization which is hardly matched in any other similar line of work. We have that constantly before us, and yet many of our members, and particularly many outsiders, to-day are unwilling to give their time or their financial aid in forwarding our cause. Let us take example from our honorable opponents. Let us, during the coming year, endeavor to advance the work of the association, first of all by securing new members, as so ably urged by Mr. Pessano this morning, as being necessary if the organization is to grow, and if the scope of the organization is to increase, and, secondly, by giving financial aid when called upon, and, last, and by no means least, giving the Administrative Council and the officers and our commissioner and secretary of the association the loyal support of our membership.

By these means the work of this association can go forward, and it can be even a more powerful and efficient agent for industrial peace in our foundries in times to come than it has been in the past. I thank you again for the honor conferred upon me, and assure you I will use every effort to carry on the work to your satisfaction and for the welfare of the association.

I. W. Frank of Pittsburgh, who is now in Mexico, was unanimously elected vice-president, his name being presented by Mr. Gates and seconded by Mr. Covell, in appropriate speeches. John R. Russel, who was elected treasurer, was warmly eulogized in the presentation speeches, and his election was followed by an ovation from the members of the association. The names of the various members selected to serve as committeemen of the various districts, as presented by the committee, were read to the association and acted upon as a whole. The following are the officers elected:

President, F. T. Towne, Yale & Towne Mfg. Co., Stamford, Conn.
Vice-President, Isaac W. Frank, United Engineering & Foundry Co., Pittsburgh, Pa.
Treasurer, John R. Russel, Russel Wheel & Foundry Co., Detroit, Mich.
Secretary, A. E. McClintock, Detroit, Mich.

FIRST DISTRICT COMMITTEE.

R. D. Reed, chairman, H. B. Smith Co., Westfield, Mass.
Geo. H. Gibby, vice-chairman, Condor Iron Foundry Co., Boston, Mass.
Howard S. Hart, Russell & Erwin Mfg. Co., New Britain, Conn.
Paul B. Morgan, Morgan Construction Co., Worcester, Mass.
F. B. Farnsworth, McLagon Foundry Co., New Haven, Conn.

SECOND DISTRICT COMMITTEE.

W. L. Herendeen, chairman, Herendeen Mfg. Co., Geneva, N. Y.
H. Van Atta, vice-chairman, J. L. Mott Iron Works, New York, N. Y.
Jas. H. Caldwell, Ludlow Valve Co., Troy, N. Y.
Arthur E. Barlow, Newark, N. J.
H. W. Wendt, Buffalo Forge Co., Buffalo, N. Y.

THIRD DISTRICT COMMITTEE.

Willis Brown, chairman, Walker Foundry Co., Erie, Pa.
W. S. Hallowell, vice-chairman, Harrison Safety Boiler Works, Philadelphia, Pa.
J. S. Stirling, United States Shipbuilding Co., Wilmington, Del.
Howard Carlton, South Baltimore Foundry Co., Baltimore, Md.
H. M. Wilson, Taylor, Wilson & Co., Pittsburgh, Pa.

FOURTH DISTRICT COMMITTEE.

J. H. Webster, chairman, Variety Iron Works Co., Cleveland, Ohio.
J. D. Leary, vice-chairman, Queen City Foundry Co., Cincinnati, Ohio.
Chas. A. Stowers, Akron Engineering Co., Akron, Ohio.
C. H. Morgan, Morgan Engineering Co., Alliance, Ohio.
H. J. Boggis, Taylor & Boggis Foundry Co., Cleveland, Ohio.

FIFTH DISTRICT COMMITTEE.

Wm. H. Taylor, chairman, Chandler & Taylor Co., Indianapolis, Ind.
H. K. McLean, vice-chairman, Link-Belt Machinery Co., Chicago, Ill.
Ferd. Schwedtman, Magnetite Foundry Co., St. Louis, Mo.
Lewis Searing, Denver Engineering Works Co., Denver, Col.
C. R. Stephens, Moline Plow Co., Moline, Ill.

SIXTH DISTRICT COMMITTEE.

O. P. Briggs, chairman, Minneapolis Steel & Machinery Co., Minneapolis, Minn.
Irving H. Reynolds, vice-chairman, Allis-Chalmers Co., Milwaukee, Wis.
C. M. Powers, St. Paul Foundry Co., St. Paul, Minn.
T. J. Neacy, Filer & Stowell Co., Milwaukee, Wis.
E. H. Walker, J. I. Case Threshing Machine Co., Racine, Wis.

SEVENTH DISTRICT COMMITTEE.

C. Bermingham, chairman, Canadian Locomotive Co., Limited, Kingston, Ont.
W. Angus, vice-chairman, Canada Switch & Spring Co., Montreal, Que.
Chas. H. Carrier, Carrier, Laine & Co., Levis, Que.
G. W. Watts, Canada Foundry Co., Toronto, Ont.
H. Cockshutt, Cockshutt Plow Co., Brantford, Ont.

EIGHTH DISTRICT COMMITTEE.

T. H. Benners, chairman, Birmingham Machine & Foundry Co., Birmingham, Ala.
E. Van Winkle, vice-chairman, E. Van Winkle Gin & Machine Co., Atlanta, Ga.
P. H. McArdle, Standard Pulley Mfg. Co., New Orleans, La.
W. D. Tynes, Hardie-Tynes Foundry & Machine Co., Birmingham, Ala.
A. D. Scofield, J. S. Scofield Sons' Co., Macon, Ga.

National Metal Trades Association.

Upon request of some of the members, E. F. DuBrul of Cincinnati, first vice-president and commissioner of the National Metal Trades' Association, was given opportunity to address the association. Mr. DuBrul made a stirring address, setting forth the aims and objects of the Metal Trades' Association, explaining that it is necessary for employers to meet organization by organization and that the same advantages that have been derived by the organization of the founders could be and should be secured by the other interests connected with the metal trades. He was severe upon the conditions at Chicago, which city he said was largely under the domination of various unions, due in large measure to the inaction or lack of organization of employers in that city.

It was announced that after the adjournment of the convention another session of the administrative council would be held. Upon motion the convention adjourned *sine die*.

Before the close of the convention 221 delegates had registered. The following is a list of the members and others in attendance:

W. D. Sargent, American Brake Shoe & Foundry Co., New York City.
F. T. Towne, Yale & Towne Mfg. Co., Stamford, Conn.
John R. Russel, Russel Wheel & Foundry Co., Detroit, Mich.
O. P. Briggs, Minneapolis Steel & Machinery Co., Minneapolis, Minn.
Willis Brown, Walker Foundry Co., Erie, Pa.
W. L. Herendeen, Herendeen Mfg. Co., Geneva, N. Y.
C. L. Newcomb, Deane Steam Pump Co., Holyoke, Mass.
Wm. M. Taylor, Chandler & Taylor Co., Indianapolis, Ind.
J. H. Webster, Variety Iron Works, Cleveland, Ohio.
Jno. E. McIntosh, McIntosh, Seymour & Co., Auburn, N. Y.
Joseph Wright, Dominion Radiator Co., Toronto, Canada.
Edward F. Jones, Jones of Binghamton, Binghamton, N. Y.
R. D. Reed, H. B. Smith Co., Westfield, Mass.
Edward Maher, Maher & Flockhart, Newark, N. J.
Thos. E. Durban, Erie City Iron Works, Erie, Pa.
John A. Rathbone, United States Heater Co., Detroit, Mich.
A. I. Lewis, Michigan Brass & Iron Works, Detroit, Mich.
Geo. A. True, Northern Engineering Works, Detroit, Mich.
H. N. Covell, Lidgerwood Mfg. Co., Brooklyn, N. Y.
J. H. Kirkwood, Fanner Mfg. Co., Cleveland, Ohio.
E. H. Penning, Walworth Run Foundry, Cleveland, Ohio.
W. B. Green, Palmers & DeMooy Foundry Co., Cleveland, Ohio.
C. F. Seelbach, Forest City Foundry Co., Cleveland, Ohio.
H. J. Boggis, Taylor & Boggis Foundry Co., Cleveland, Ohio.
C. J. Morgan, Taylor & Boggis Foundry Co., Cleveland, Ohio.
John E. Zimmerman, Eureka Foundry Co., Dayton, Ohio.
E. C. Hoffman, Hoffman Hinge & Foundry Co., Cleveland, Ohio.
Julius Beeman, Hoffman Hinge & Foundry Co., Cleveland, Ohio.
John Stuber, Ohio Foundry Co., Cleveland, Ohio.
Wm. Greenbaum, Acme Foundry Co., Cleveland, Ohio.
C. M. Miller, Superior Foundry Co., Cleveland, Ohio.
J. L. Jackson, Jackson & Church Co., Saginaw, Mich.
J. W. Osborn, Walworth Run Foundry Co., Cleveland, Ohio.
C. C. Scheible, Walworth Run Foundry Co., Cleveland, Ohio.
Thos. M. Roche, secretary Cleveland Founders' Association.
Thos. M. Eynon, Eynon-Evans Mfg. Co., Philadelphia, Pa.
H. M. Wallis, J. I. Case Plow Works, Racine, Wis.
H. F. Miller, Acme Foundry Co., Cleveland, Ohio.
T. H. Benners, Birmingham Machinery & Foundry Co., Birmingham, Ala.
W. D. Tynes, Hardie-Tynes Foundry & Machine Co., Birmingham, Ala.
T. J. Caldwell, Caldwell-Watson Foundry & Machine Co., Birmingham, Ala.
Benj. F. Fox, Benj. Fox's Sons, New York City.
W. A. Russell, Michigan Brass & Iron Works, Detroit, Mich.
D. J. Kilby, Kilby Mfg. Co., Cleveland, Ohio.
Wm. H. Baush, Baush Machine Tool Co., Springfield, Mass.
Louis Epp, Deere & Mansur Co., Moline, Ill.
M. E. Kennedy, Kennedy Valve Mfg. Co., New York, N. Y.
Jas. Eastwood, Benj. Eastwood Co., Paterson, N. J.
Chas. T. Wales, Empire Foundry Co., New Brunswick, N. J.
A. J. Vierling, Paxton & Vierling Iron Works, Omaha, Neb.
Louis Vierling, Vierling, McDowell & Co., Chicago, Ill.
Thos. Hoops, Jr., Wilcox, Crittenden & Co., Middletown, Conn.
W. W. Balkwill, Cleveland Steel Castings Co., Cleveland, Ohio.
Alonzo W. Whitcomb, Kabley Mfg. Co., Worcester, Mass.
W. S. Hanse, Stover Mfg. Co., Freeport, Ill.
A. S. Held, Stover Mfg. Co., Freeport, Ill.
E. L. Walcott, Modern Iron Works, Quincy, Ill.
Chas. A. G. Winther, Chapman Valve Mfg. Co., Indian Orchard, Mass.
Ellis L. Rowe, Rensselaer Mfg. Co., Troy, N. Y.
Wm. Gleason, Genesee Foundry Co., Rochester, N. Y.
Fred. F. Stockwell, Barbour-Stockwell Co., Boston, Mass.
W. A. Porter, E. W. Bliss Co., Brooklyn, N. Y.
Chas. A. Stowers, Akron Engineering Co., Akron, Ohio.
Henry A. Carpenter, A. Carpenter & Sons Foundry Co., Providence, R. I.
J. G. Pope, Falls Rivet & Machinery Co., Cuyahoga Falls, Ohio.
Frank Fieberger, Akron Foundry Co., Akron, Ohio.
L. S. Dickey, Macbeth Iron Co., Cleveland, Ohio.
Chas. A. Maher, Maher Wheel & Foundry Co., Cleveland, Ohio.
Wm. C. Doherty, Doherty Bros., Lowell, Mass.
J. L. Anthony, Weir Stove Co., Taunton, Mass.
R. M. Leach, Weir Stove Co., Taunton, Mass.
C. F. Wheaton, Dodge Mfg. Co., Toronto, Ont.
Geo. B. Buckingham, Arcade Malleable Iron Co., Worcester, Mass.
J. F. Lanigan, Davis Foundry Co., Lawrence, Mass.
C. S. Bonsall, Buckeye Engine Co., Salem, Ohio.
S. V. Kennedy, D. M. Osborne & Co., Auburn, N. Y.
Stanley G. Flagg, Jr., Stanley G. Flagg & Co., Philadelphia, Pa.
L. E. Thomas, United Engineering & Foundry Co., Youngstown, Ohio.
G. R. Metcalf, Erie Malleable Iron Co., Erie, Pa.
Geo. E. Camp, Standard Harrow Co., Utica, N. Y.
Alexander Jarecki, Jarecki Mfg. Co., Erie, Pa.
E. G. Rippel, Buffalo Foundry Co., Buffalo, N. Y.
W. E. Miller, Fairbanks, Morse & Co., Chicago, Ill.
F. A. Ingalls, Buda Foundry & Mfg. Co., Harvey, Ill.
Geo. W. Watts, Canada Foundry Co., Toronto, Ont.
R. H. Gilmour, Canada Foundry Co., Toronto, Ont.
Geo. Wiard, Wiard Plow Co., Batavia, N. Y.
S. H. Chapman, Ontario Wind Engine & Pump Co., Toronto, Ont.
F. D. Wanning, Birmingham Iron Foundry Co., Derby, Conn.
Walter Perry, Farrell Foundry & Machine Co., Ansonia, Conn.
H. P. Ranney, American Shipbuilding Co., Cleveland, Ohio.
Robert Weir, Weir & Craig Mfg. Co., Chicago, Ill.
Jno. N. Woodfin, Lincoln Iron Works, Rutland, Vt.
Edward King, Pennsylvania Engineering Works, New Castle, Pa.
O. R. Hanchett, Ideal Foundry Co., Ashtabula, Ohio.
A. N. Abbe, P. & F. Corbin, New Britain, Conn.
O. P. Letchworth, Pratt & Letchworth Co., Buffalo, N. Y.
E. H. Walker, J. I. Case Threshing Machine Co., Racine, Wis.
H. Van Atta, J. L. Mott Iron Works, New York, N. Y.
H. Ainsworth, Williams, White & Co., Moline, Ill.
J. C. Bradley, Pratt & Letchworth Co., Buffalo, N. Y.
S. S. Gould, Goulds Mfg. Co., Seneca Falls, N. Y.
F. E. Wheeler, International Heater Co., Utica, N. Y.
E. H. Cole, Eaton, Cole & Burnham Co., New York, N. Y.
W. F. Floyd, Eaton, Cole & Burnham Co., New York, N. Y.
Jas. McNaughton, American Locomotive Co., Dunkirk, N. Y.

Wm. Barton, Barton & Maas Foundry Co., Chicago, Ill.
Henry E. Pridmore, Chicago, Ill.
E. E. Durant, Geo. F. Warner Mfg. Co., New Haven, Conn.
H. A. Leacock, Economy Foundry & Machine Co., Syracuse, N. Y.
F. A. Scheffler, Marine Engine & Machine Co., Harrison, N. J.
Arthur E. Barlow, Newark, N. J.
Jno. M. Taylor, Taylor-Forbes Co., Ltd., Guelph, Ont.
J. E. Hunter, Jas. Hunter Machine Co., North Adams, Mass.
D. F. Eagan, Henry E. Pridmore Co., Chicago, Ill.
Thos. Devlin, Thos. Devlin Mfg. Co., Philadelphia, Pa.
H. Gilbert Hart, Hart & Crouse, Utica, N. Y.
F. E. Delano, Ideal Mfg. Co., Detroit, Mich.
A. I. Findlay, *Iron Trade Review*, Cleveland, Ohio.
W. A. Stevenson, Norwood Engineering Co., Florence, Mass.
E. F. DuBrul, National Metal Trades Association, Cincinnati, Ohio.
P. Kennedy, Kennedy Foundry, Baltimore, Md.
E. R. Beeman, Monitor Drill Co., Minneapolis, Minn.
David Townsend, Gruson Iron Works, Eddystone, Pa.
Wm. S. Hallowell, Harrison Safety Boiler Works, Philadelphia, Pa.
W. N. Kuhns, Kuhns Bros., Dayton, Ohio.
F. Macon Cresson, Geo. V. Cresson Co., Philadelphia, Pa.
E. L. Dawes, Standard Sanitary Mfg. Co., Pittsburgh, Pa.
Oscar Marschurtz, Standard Sanitary Mfg. Co., Louisville, Ky.
T. W. Sheriffs, Sheriffs Mfg. Co., Milwaukee, Wis.
R. W. Grace, Bucyrus Co., Milwaukee, Wis.
Wm. Francis, Francis & Nygren Co., Chicago, Ill.
Harry S. Hodge, Detroit, Mich.
H. L. Ide, A. L. Ide & Sons, Springfield, Ill.
Enos Bookwalter, A. L. Ide & Sons, Springfield, Ill.
Antonio C. Pessano, Great Lakes Engineering Works, Detroit, Mich.
Paul B. Morgan, Morgan Construction Co., Worcester, Mass.
Ralph E. Kingsbury, Morgan Construction Co., Worcester, Mass.
J. A. Oberhelman, J. A. Oberhelman Foundry Co., Cincinnati, Ohio.
Geo. McG. Morris, Jno. B. Morris Foundry Co., Cincinnati, Ohio.
R. H. North, North Bros. Mfg. Co., Philadelphia, Pa.
Stuart R. Carr, Stuart R. Carr & Co., Baltimore, Md.
Jas. S. Stirling, Harlan & Hollingsworth Co., Wilmington, Del.
Geo. T. Marsh, South Baltimore Foundry, Baltimore, Md.
Geo. T. Brown, Brown Cotton Gin Co., New London, Conn.
W. T. Partridge, *The Iron Age*, Chicago, Ill.
Lyman P. Hubbell, Fillmore Avenue Foundry & Iron Works, Buffalo, N. Y.
J. L. Ketcham, Brown-Ketcham Iron Works, Indianapolis, Ind.
Robert Weust, National Metal Trades Association, Cincinnati, Ohio.
H. J. Rober, Bettendorf Metal Wheel Co., Springfield, Ohio.
Henry B. Sargent, Sargent & Co., New Haven, Conn.
Wm. Gilbert, Buckeye Foundry Co., Cincinnati, Ohio.
Wm. Yagle, Wm. Yagle & Co., Pittsburgh, Pa.
W. C. Scott, Thos. Carlin's Sons Co., Allegheny, Pa.
S. E. Hiles, Samuel C. Tatum Co., Cincinnati, Ohio.
Henry J. Gosiger, Eureka Foundry Co., Cincinnati, Ohio.
H. D. Erhart, Chris. Erhart, Cincinnati, Ohio.
Salmon Jones, Jones & Bruce, Cincinnati, Ohio.
A. G. Wilson, Hoefinghoff & Laue Co., Cincinnati, Ohio.
C. E. Greenwald, I. & E. Greenwald Co., Pittsburgh, Pa.
F. S. Jackman, Pittsburgh Mfg. Co., Pittsburgh, Pa.
F. Johannigmann, Johannigmann Foundry Co., Cincinnati, Ohio.
Henry J. Weber, Newport Brass & Iron Foundry Co., Newport, Ky.
Frank Land, Gaar, Scott & Co., Richmond, Ind.
Oliver Phelps, Lorain Foundry Co., Lorain, Ohio.
A. D. Plamondon, A. Plamondon Mfg. Co., Chicago, Ill.
J. D. Leary, Queen City Foundry Co., Cincinnati, Ohio.
Lincoln Haney, Globe Foundry, Cincinnati, Ohio.
H. F. Frohman, Obermayer Co., Cincinnati, Ohio.
W. E. Rockwood, Rockwood Mfg. Co., Indianapolis, Ind.
H. M. Wilson, Taylor, Wilson & Co., Allegheny, Pa.
J. H. Morcom, Colorado Iron Works Co., Denver, Col.
C. W. Russel, Russel Wheel & Foundry Co., Detroit, Mich.
Walter Laidlaw, Laidlaw-Dunn-Gordon Co., Cincinnati, Ohio.
Chas. W. Pusey, Pusey & Jones Co., Wilmington, Del.
Jos. A. Stone, Riverside Foundry Co., Cleveland, Ohio.
P. J. Martin, Lakeside Malleable Iron Co., Racine, Wis.
A. W. Russel, Russel Wheel & Foundry Co., Detroit, Mich.
J. Dwyer, Michigan Stove Co., Detroit, Mich.
H. K. McLean, Link-Belt Machinery Co., Chicago, Ill.
T. A. Jones, W. A. Jones Foundry & Machine Co., Chicago, Ill.
Johnson Stewart, Co-operative Foundry Co., Detroit, Mich.
W. E. Stewart, Co-operative Foundry Co., Detroit, Mich.
Thos. F. Meek, Detroit Steel Castings Co., Detroit, Mich.
Elmer Maine, Detroit Steel Castings Co., Detroit, Mich.
Rutledge Armstrong, Detroit Steel Castings Co., Detroit, Mich.
S. T. Johnson, Whiting Foundry Equipment Co., Harvey, Ill.
R. C. Barr, Cleveland & Barr, Chicago, Ill.
T. A. Cummings, R. M. Eddy Foundry Co., Chicago, Ill.
W. J. Michael, Tarrant Foundry Co., Chicago, Ill.
P. W. Gates, Allis-Chalmers Co., Chicago, Ill.
Chas. M. Power, St. Paul Foundry Co., St. Paul, Minn.
Geo. Harroun, Medart Patent Pulley Co., St. Louis, Mo.
H. L. Whitman, Whitman Agricultural Co., St. Louis, Mo.
Allen R. Foote, Public Library, Chicago, Ill.
V. B. Calder, Detroit Shipbuilding Co., Detroit, Mich.
T. H. Simpson, Michigan Malleable Iron Co., Detroit, Mich.
F. H. Harris, Harris Toy Co., Toledo, Ohio.
Edward C. Wells, Quincy Engine Works, Quincy, Ill.
Frank D. Runser, Mahoning Foundry & Machine Co., Youngstown, Ohio.
H. M. Leland, Leland & Faulconer Mfg. Co., Detroit, Mich.
Jas. J. Wilson, Leland & Faulconer Mfg. Co., Detroit, Mich.
C. H. Carrier, Carrier, Laine & Co., Levis, Que.
H. W. Hoyt, Allis-Chalmers Co., Chicago, Ill.
B. T. Skinner, Advance Thresher Co., Battle Creek, Mich.
Wm. Inglis, John Inglis & Sons, Toronto, Ont.
F. T. Frost, Frost & Wood Co., Ltd., Smith Falls, Ont.
Thos. P. Gaddis, Dayton Malleable Iron Co., Dayton, Ohio.
D. F. O'Neil, Western Foundry Co., Chicago, Ill.
Henry Laidlaw, Laidlaw-Dunn-Gordon Co., Cincinnati, Ohio.
Andrew J. Caldwell, Crane Co., Chicago, Ill.
J. L. Halyburton, Michigan Brass & Iron Works, Detroit, Mich.
Wm. Scott, Roe Stephens Mfg. Co., Detroit, Mich.
B. Frank Beatty, Penn Steel Castings Co., Chester, Pa.
T. L. Moffat, Moffat Stove Co., Weston, Ont.
J. B. Jones, Utica Heater Co., Utica, N. Y.
T. J. Drummond, Montreal Pipe Foundry Co., Montreal, Que.
Wm. Hamilton, Wm. Hamilton Mfg. Co., Peterborough, Ont.
L. R. Cope, Vincent Valve Co., Sandusky, Ohio.
R. R. Sauntleroy, Link-Belt Machinery Co., Chicago, Ill.

To Form Bicycle Pool.

CLEVELAND, OHIO, November 22, 1902.—Representatives of 15 leading manufacturers of bicycles, including the bicycle combination, met at the Hollenden Hotel, in this city, on November 21. The meeting was an adjourned meeting following a session held in New York a week ago. It was announced that the meetings were held for the purpose of forming an association, to be known as the Bicycle Manufacturers' Association, with a view to standardizing grades and styles of wheels, fixing more uniform rules for discounts and rebates, and formulating other plans for the general improvement of the bicycle trade in general. The chairman of the meeting was George N. Pierce of the George N. Pierce Company of Buffalo, a leading independent maker; and the secretary was E. E. Jackson, Jr., a prominent New York attorney, who for several years has been supervisor of the Brass Manufacturers' Association, and who is understood to represent the American Cycle Mfg. Company. In a prepared interview Mr. Jackson gave out that nothing definite had been accomplished at the Cleveland meeting, but that all had agreed to make a concerted effort to improve conditions in the business. Committees were appointed to formulate plans for standardizing, and these were to be considered at a meeting to be held in Buffalo next June. Mr. Jackson stated that the total output of wheels in this country this year amounted to 600,000, but that on account of the competition and wide range of options given by all the leading manufacturers, practically no money had been made. While it was too late this year to make any changes in methods, it seemed probable that through concerted efforts conditions would be much improved in another year.

From another source, known to be thoroughly reliable and in close touch with the bicycle interests at the meeting, *The Iron Age* learned that the organization of an association had been proposed by parties identified with the American Cycle Mfg. Company, who are now in the hands of a receiver, the paramount idea being to induce the leading independent manufacturers of bicycles to enter a pool in which the total output of bicycles produced during a season was to be prorated. Incidentally other reforms were to be adopted by all, which would tend to improve conditions for all concerned.

Mr. Jackson was intrusted with the duty of arranging the pool on a basis which should be satisfactory to all. The meeting held in New York was said to have been for the purpose of broaching the subject to independent manufacturers, and at the Cleveland meeting it was hoped that details would be arranged. The majority of the independent makers are said to have expressed themselves in favor of a change, but when it came to furnishing data relative to the number of wheels sold thus far for next year, it was found that the independents had already sold about 200,000 out of a possible 250,000 wheels to the jobbing trade of the country. Of course, under these conditions there was no possibility of prorating the output for the coming year, and it was decided to let the matter rest until the opening of another season. In the meantime Mr. Jackson is to

work up the plan of pooling the output and standardizing models.

Those present at the Cleveland meeting represented about 95 per cent. of the total output of wheels built in this country.

Canadian Bounties Considered.

Canadian Steel Not Subject to Increased Duties.

WASHINGTON, D. C., November 25, 1902.—The decision of the Board of General Appraisers advancing the foreign market value of steel billets has resulted in an attempt on the part of certain customs officials at the ports of Philadelphia, Baltimore and Boston to advance invoices on billets and other forms of steel imported from Canada, because of the fact that the Canadian Government pays a bounty on the production of such material. The Secretary of the Treasury, to whose attention the matter has been brought, has promptly issued instructions to the effect that whatever bounty may be paid by the Canadian Government is granted on production and not upon exportation, and hence cannot be taken into account either in determining invoice valuations or in assessment of countervailing duties.

The decision of the Board in the German billet case appears to have been promptly followed by a general investigation on the part of appraising officers and special agents at certain ports to determine whether the special conditions in any foreign market would warrant the advancing of invoices of steel imported therefrom. The officials at Philadelphia, Baltimore and Boston have had their attention drawn by several parties to the statements made in the last annual report of the American Iron and Steel Association with regard to Canadian bounties, in which General Manager James M. Swank says:

> The recent rapid development of the iron and steel industries of Canada has been greatly promoted by the action of the Dominion Parliament in enacting the bounty act of June 29, 1897. But the bounty system had previously been in force in Canada. In 1883 the Dominion Parliament authorized the payment of a bounty of $1.50 a ton upon all pig iron manufactured in Canada. This bounty was continued until July 1, 1869, when the rate was made $1 a ton. A further change was made on July 1, 1892, when the rate was increased to $2 a ton until July 1, 1897, and in 1894 additional legislation provided for the payment of a bounty of $2 a ton on puddled bars and on steel billets.
>
> The act of 1897, most fruitful of all, provided for the payment of $3 per ton "on steel ingots manufactured from ingredients of which not less than 50 per cent. of the weight thereof consists of pig iron made in Canada; $3 per ton "on puddled iron bars manufactured from pig iron made in Canada," $3 per ton "on pig iron on the proportion produced from Canadian ore," and $2 per ton "on pig iron on the proportion produced from foreign ore." These bounties have been extended to June 30, 1907, provided, however, that they shall be annually reduced after April 23, 1902, as follows: From that date to June 30, 1903, 90 per cent. shall be paid; from July 1, 1903, to June 30, 1904, 75 per cent.; from July 1, 1904, to June 30, 1905, 55 per cent.; from July 1, 1905, to June 30, 1906, 35 per cent.; from July 1, 1906, to June 30, 1907, 20 per cent.
>
> Down to June 30, 1901, there had been paid in iron and steel bounties under the foregoing acts a total of $2,168,435. In addition to these payments the province of Ontario has paid since 1894 a bounty of $1 a ton on all pig iron made in the province from iron ore mined in Ontario. Down to October 31, 1901, there had been paid under this legislation $59,741.

It is perhaps difficult to understand how a bounty on production, paid alike whether the product was consumed at home or exported, could be construed as a legitimate basis for the assessment of the countervailing duties provided by Section 5 of the Dingley act, which requires that "whenever any country, dependency, or colony shall pay or bestow directly or indirectly, any bounty or grant upon the exportation of any article or merchandise from such country, dependency, colony, and such article or merchandise is dutiable under the provisions of this act, then upon the importation of any such article or merchandise into the United States, whether the same shall be imported directly from the country of production or otherwise, and whether such article or merchandise is imported in the same condition as when exported from the country of production or has been changed in condition by remanufacture or otherwise, there shall be levied and paid, in all such cases, in addition to the duties otherwise imposed by this act, an additional duty equal to the net amount of such bounty or grant, however the same be paid or bestowed."

However this may be, appraising officers at the ports referred to have seized upon it as suggesting a method for advancing invoice values, and the appraiser at Boston went so far as to prepare a memorandum addressed to the collector, referring to the bounties paid and modestly stating that he was in doubt as to whether it was within the province of his office to report as an advisory classification, in addition to the regular rate of duty, the amount of the bounty paid until such time as the Secretary of the Treasury could issue instructions in the matter. The collector also entertaining doubts on the subject addressed a letter to the Secretary of the Treasury inclosing the appraiser's memorandum and asking for a construction of the law in the case. To this communication the Secretary has very promptly responded in a manner that will probably set at rest all doubts that may be entertained by the appraising officers at Boston or at any other port where the matter may have been investigated. The Secretary says:

> The Department is in receipt of your letter of the 18th instant, transmitting communication from the Appraiser of Merchandise at your port, wherein, referring to the bounty granted by the Dominion of Canada on iron and steel, he states that he is "in doubt as to whether it is within the province of this (his) office to report as an advisory classification, in addition to the regular rate of duty, the amount of the bounty paid until such time as the net amount of such bounties or grants shall be determined and declared by the Secretary of the Treasury under the provisions of Sec. 5" of the act of July 24, 1897.
>
> In this regard I have to inform you that the act of June 29, 1897, framed by the Dominion Parliament, grants bounties on manufacture or production which are in nowise affected by the question of exportation, and therefore such bounties do not come within the purview of Sec. 5. I may further state that the Secretary of the Treasury is the sole officer under the law clothed with authority to determine the applicability of Sec. 5 and to enforce its provisions.
>
> Whether the said bounty is within or without the law, it is not a matter of appraisement, for the reason that appraisement —the determination of the foreign market value of imported merchandise—is quite independent of the existence or nonexistence of the bounty. W. L. C.

Sterling Steel Casting Company.—The new plant of the Sterling Steel Casting Company, at Braddock, near Pittsburgh, is now in full operation. This plant is modern throughout and was built this year. It contains two 20-ton open hearth furnaces, with all necessary equipment, consisting of compressed air appliances, molding machines and other accessories. The foundry building is 150 feet wide by 425 feet long. It is equipped with five electric traveling cranes of 15 to 25 tons capacity, and six 5-ton hoists for molding. The product of the plant is steel castings for railroad work from the smallest size up to 30 tons in weight. The officers are F. J. Wainright, Jr., president; H. E. Wainright, Jr., secretary, and Uriah Tinker, treasurer.

The State Railroad Commission has granted the Buffalo & Susquehanna Railroad Company a certificate of necessity, permitting them to construct their proposed railroad. The new line is designated as an extension of the Buffalo & Susquehanna, which is a Pennsylvania line with track leases in New York State that bring it up to Wellsville. It will be about 84 miles long and will pass from Wellsville to Buffalo through the Boston Valley, which has a population of about 27,000 persons. The company now operate a mileage greater than 150, several spurs are building, aggregating about 60 miles, from the main line in Pennsylvania to new coal holdings. The same interests behind the new road own blast furnaces now building and a dockage site in Buffalo, bituminous mines and lumber mills in Pennsylvania enough to insure big freightage for the new road. It will be a single track of 80 pound rails.

The auditing department of the Youngstown Works of the American Bridge Company, at Youngstown, Ohio, has been removed to Pittsburgh, and has been combined with the auditing department of the Pittsburgh office, in the Frick Building.

The Iron Age

New York, Thursday, November 27, 1902.

DAVID WILLIAMS COMPANY, - - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - - - ASSOCIATE EDITOR.
RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - - - BUSINESS MANAGER.

Features of the Founders' Convention.

One of the most significant features of the convention of the National Founders' Association held at Detroit last week was the exhibition of control exercised by the Administrative Council over the actions of the members assembled, like the propeller of an ocean liner—under the surface, but very effective. Meetings of the council were held before and after each session of the general convention, and subsequent events developed that the council was possessed of clear discernment, sound judgment and diplomacy, contributing strength to execute the plan of campaign mentally outlined. Such generalship is seldom exercised at trade conventions. One is at a loss which to admire the more, the masterful hand or the subtle application of its influence, for all the meetings of the council were executive sessions and it is doubtful if the majority of the members were aware that the convention was being guided other than by their own deliberations. That rocks were avoided and the convention craft brought safely through some shallow waters will be evident to those who were present if they review the proceedings of the convention. The changing of a strong sentiment against a nine-hour day under any consideration to general acquiesence for a shorter work day upon stipulated conditions was not the least of the accomplishments of that silent power. There were no dramatic scenes; when the discussion became irrelevant and expressions a little tangential the convention adjourned temporarily.

One of the pleasing features of the convention was the attitude of the retiring president, whose address was conspicuous because of its broad view, high tone and conciliatory spirit. The report of the commissioner was especially interesting as illustrating how much prosperity is responsible for labor difficulties, although the increased and increasing cases brought to his attention were not attributed to that cause.

The report of the chairman of the Conference Committee—as did that of the commissioner—brought out the attitude of the officers of the Iron Molders' Union, as well as that of the Founders' Association, in a favorable light, and whatever may be said against the union methods, it is evident that when the full body of the union has grown to the stature of the union Conference Committee capital and labor will assume their natural complemental positions.

The convention proceedings made evident that the founders' sentiment has crystallized into a desire, if not a demand, for a national agreement with the molders as opposed to the local agreements heretofore in force. The founders, too, are equally determined to have abuses—which have gradually crept into shop practice—corrected, and any modification of existing agreements must be made on such a basis. Differentiation of the wage rate, limitation of output, ratio of apprentices, and the right to operate molding machines and other devices to facilitate molding are the principal points of the ground upon which the founders will ever consider a modification of working hours, and as the association will act as a unit in the premises, success, more or less complete, may be expected to crown the efforts now making.

It is notable that the resolutions adopted at Detroit declare against local agreements, yet assert that the work day is a local issue, while demanding a national agreement in which the shortening of a day's work will only be considered in connection with certain stipulated conditions. This is certainly incongruous, but the intention is evident—a national agreement, modified in certain districts to meet local conditions.

It was declared at the convention that the present scarcity of skilled molders is due to the low ratio of apprentices solely. It is well to remember, however, that the great and unusual activity in the foundries during the past year is largely responsible for the present relative scarcity of skilled labor, and that with the pressure removed skilled help in greater measure will be available. This difficulty may be adjusted naturally in a short time, even if no action is taken to remove the artificial restriction complained of.

A Severe Test of Financial Strength.

We appear to have passed safely through the stormy period to which financiers have for some time been looking with many misgivings. During the early fall a great deal of apprehension was caused by the knowledge in financial circles that many syndicates were carrying heavy burdens entailed by reason of inability to float securities for consolidations which they had underwritten. It was known further that a vast amount of money had been borrowed from foreign bankers by syndicates in this country to assist them in carrying through these operations. The very large crops with which the country had been favored were also expected to call for a larger amount of cash than usual to enable the crops to be marketed. The situation was rendered more ominous by warnings which were voiced by men of prominence in financial circles.

At the first indication of stringency in the money market the Secretary of the Treasury made extraordinary efforts to afford relief to the banking interests. It was feared at the time that even these preparations would fall short of the necessary means of relief. We now see in the light of what has happened in the past two weeks that all the measures adopted were not adequate to avert the financial storm. The liquidation which has occurred in Wall Street was of greater extent than had been foreseen by any but the most pessimistic. The storm broke and raged with fury for some considerable time and not only heavily depressed the values of securities of companies whose standing was not very high in the estimation of the investing public, but also greatly reduced the values of gilt edged stocks and bonds. This is always a feature of a financial disturbance. It is then found necessary to realize on good securities in order to protect those which have a lower standing in the estimation of the public. The liquidation which was in progress for almost two weeks was at times on the verge of precipitating a panic.

Now that matters have quieted down and we are able to look back over the situation a great feeling of relief is evident in every direction. It is a very remarkable fact that during this period no failure of any importance was chronicled. The small as well as large financial institutions weathered the storm with safety. How many were crippled during the time it is of course impossible to ascertain. The fact that no failures of conse-

quence occurred is the best reason for believing that no serious results are to follow. While an experience of this character is most unwelcome, yet to pass through such a period with nothing in the way of disaster to mark it is really a matter of national congratulation. It shows that the finances of this country are on a vastly more substantial basis than had been anticipated. It demonstrates that the exceedingly pessimistic views of men of prominence in financial affairs have not been warranted. Possibly matters have been put in better shape as a result of the warnings from sources of this character, but on the other hand it may also reasonably be assumed that these warnings assisted in making the liquidation much more severe than would otherwise have been the case. Unquestionably a great many holders of securities felt that it was incumbent on them to lighten their loads as soon as they perceived that values were declining, and this caused the work of recuperation to be more difficult. One fact has been strikingly brought out, and that is that the reserve purchasing power in this country is much greater than had been expected. While timid holders of securities were offering them at whatever they would realize, substantial interests were ready to take them and pay for them.

Now that the storm is over and the atmosphere has cleared business interests can take a decidedly hopeful view of the future. The country is in possession of large crops, which will give the railroads an enormously increased business over that of last year, and at the same time will enable us to supply the world with great quantities of necessaries on which profitable prices are being realized. We can really look forward to the future with much more confidence than if we had not passed through a trying period of security liquidation. Prices of manufactured products may be lower than at present, but a sufficiently heavy volume of business is sure to make all interested feel safe in laying plans for the coming year. The advances in wages which have been made by railroad companies have added greatly to the purchasing power of a large proportion of the people, and the strength of general business lies in the maintenance of this purchasing power.

Time Consumed in War Ship Construction.

The paper which elicited the liveliest discussion at the meeting of the Society of Naval Architects and Marine Engineers, last week, was the one by George W. Dickie, manager of the Union Iron Works, on "Why it Takes so Long Time to Build and Equip a Naval Vessel for the United States." It amounted, in fact, to a rather severe arraignment of the superintending constructor of the navy, in general, and an acrimonious criticism of the Bureau of Construction and Repair, in particular. The constructor was blamed as being responsible for much of the delay and the consequent loss of money by the builder, while the bureau was accused of unnecessarily changing the plans and of taking too much time in making alterations of importance. It was pointed out that changes suggested at the yard by the superintending constructor had to be forwarded to Washington for approval, were then returned, perhaps for additional data, sent again to Washington, and so on. Mr. Dickie says:

"Where plans have to be submitted to the bureau for approval, and all plans involving any design have to be so submitted, we see no advantage in such plans being labored on sometimes for months by the superintending constructor and his staff of draftsmen, and by them returned over and over again to the builder for changes and corrections, then finally sent to the bureau for a similar process, there ending often in disapproval. Why should not the builder prepare his plans as he thinks will best carry out the requirements of the specifications and the adopted general designs, submit these plans to the bureau through the superintending constructor, who would give the bureau his opinion and recommendation in regard to them? These plans would reach the bureau without being so marred by changes and erasures, and we are satisfied would be as often approved by the bureau as they are now, saving much time and expense, both to the builder and to the Navy Department; for a large part of the drafting force maintained by the Bureau of Construction and Repair at the shipyards is employed on this kind of work, that is worse than useless."

There is one point we should like to dwell upon briefly. Plans for a ship, war or merchant, cannot be handed to the builder complete in all respects, if the aim is to produce a vessel fully up to date. From three to five years are required for the work. Things are moving rapidly in the manufacturing world and alterations for the better are being made with startling rapidity. New processes, new material and new devices are constantly demanding the attention and forcing the recognition of the producer, no matter in what industry he may be engaged. A vessel designed to-day complete in every detail would be obsolete and antiquated in many particulars at the time of her trial trip. This makes changes during construction absolutely necessary in order that the ship may be up to date when finished. The Bureau of Construction has an intimate knowledge of the methods of all the large shipyards of the country and changes made in one may have an important effect upon all the others, so that a change in the plans at Newport News may affect the work at San Francisco. We are of the decided opinion that the naval authorities are pursuing a very wise course in changing their plans whenever they consider such changes advisable. In fact, there is no other road open to them.

CORRESPONDENCE.

The Harvesting Machine Industry.

To the Editor: I was very much interested in the perusal of an article in *The Iron Age* of September 18, 1902, written by R. L. Ardrey. I was born in Stark County, Ohio, in 1841, and consequently grew up surrounded by manufacturers of harvesting machinery. Mr. Ardrey speaks of Aultman & Miller of Akron, Ohio. I will go back of that and bring up the history of those days more fully.

Charles Aultman was a Methodist preacher's son, and was born in Pennsylvania near the Maryland line, or just over in Maryland, I have forgotten which. He got a notion that he could make a machine to cut grass by horse power. His father lived on a farm, and had a shop on it. Charles would work on the machine when his father was off preaching. He made the machine, but it was so heavy that he wanted to change it. He asked his father for money to improve his machine, but as the father would not give it to him, Charles ran away and came to Stark County, Ohio, where he fell in with a young man by the name of Ball, who was then working in a machine shop, I believe, at Canton. They went into partnership, but finally disagreed about the construction of the machine. Aultman claimed the cutter bar should be pushed in front of the wheels, while Ball claimed it should be drawn behind the wheels, but to one side in both cases. They dissolved partnership, and Ball went on building the Ohio mower and reaper, and afterward brought out the incased cut gear machine he called the World. Aultman built the Buckeye, with the

cutter bar in front. He spread out and had interests in several shops and became very wealthy. Then there were Russell at Massillon; the Fisher Mower & Reaper Works at Alliance; the Buckeye Mower & Reaper Works at Salem, Columbiana County; the Quaker Mower & Reaper Works, owned by the Tabors, and the Ætna Mower & Reaper Works, built up by Rank & Barnaby, whose machine was a combination of the old Ohio mower and the Buckeye, with some other improvements. Then there was the little high speed Hubbard made at Cleveland, Ohio, but it was geared up so high it soon ran itself to death. I helped set up and threw the first bundle off the first Manny reaper ever set up in our neighborhood. The machine was heavy, and I was a light chunk of a boy. They put me on to throw off the bundles.

In the bygone days when all these inventors and manufacturers were getting up machines, each and all of them tried to see if he could invent something different from the other fellow so that he could get a patent on it, and have his machine differ from any other in existence, having the parts not interchangeable in order that the farmer buying the machine would be compelled to get all his repairs from this particular maker of machine. The inventor and manufacturer especially lay awake nights studying how to make a difference to increase their dividends, and they had such a monopoly they could well afford to give a farmer a machine as a basis to furnish repairs for in the future.

Now all this has been changed, and the necessity of forming a consolidation of manufacturers, or trust, as some prefer to call it, is apparent to all who know about the business. The business has spread all over the world. The burden of keeping the different parts for repairs alone is beyond conception; it amounts to millions of dollars. Let us take up one small section of a machine—the cutter bar, guards and knife bar and the sections and the rivets. At the beginning of this industry no two were alike. There was a difference in the length and shape of the cutter bar, in the inner and outer shoes, in the number of guards on the bars, in the size of the holes in the bars, in the distance apart the holes were drilled for each guard, and in the distance from the front edge of the bar to the first hole. Then some had a small guard bar riveted on the guards to stay them and for the knife bar to run between it and the cutter bar; some did not have this small bar. Then there was a difference in the sizes of the guards and in their shape and make up. Then take the knife—the bars were of different lengths, widths and thicknesses. Some had a solid head of a particular formation; on others the head was riveted on, of different formations, with the rivet holes of different sizes and different distances apart. The sections were of different lengths and widths; the holes were of different sizes, a different distance apart in each section, a difference in distance from the side to the first hole and a difference from the back to the hole, with a corresponding difference in the holes of each knife bar. As I said before, manufacturers lay awake nights studying how to make a difference in order to beat the other fellow and to force the farmer to buy repairs from the manufacturer of this particular machine.

Much of this has become obsolete. Patents have expired, so that there is nothing to be gained from that standpoint. The business has spread out to such an extent that it becomes necessary to adopt advanced ways of doing business.

Now the only way is for manufacturers to come together and adopt the best in existence, or that may be hereafter invented. Take up these parts alone that I have mentioned—the cutter bar, guards and the knife bar and sections with their rivets. There is one length, size and shape of cutter bar that is equal to or better than any other length, size and shape; one size and shape of guard that is equal to or better than any other; one length, size and shape of the knife bar that it equal to or better than any other; one size and length of rivets that is equal to or better than any other size and length; one size and shape of section that is equal to or better than any other; one distance apart and relative distances for rivets that are equal to or better than any other.

Now by the consolidation of manufacturers a competent committee can be appointed and agree by practical tests just what is best in all these complicated details of differences and adopt a standard of sizes and formations that are interchangeable, as standard threads on bolts and in nuts and standard keys and keyways. What is true of the cutter bar, shoes, guards, knife bar, sections and rivets is true of many other parts of harvesting machinery. Many other parts can be made interchangeable. This can only be done by a consolidation of manufacturers' interests, which is as much to the interest of the farmer as to the manufacturer. The farmer could then borrow or buy repairs of his neighbor in case of a breakdown, even if his neighbor had a different make of machine. The burden of keeping all these different parts in stock for repairs would be done away with, which burden falls on the farmer almost entirely in the end. The manufacturer does not keep these repairs in stock and all over the world for fun; the farmer is to the disadvantage and foots the bill at the end.

The time has come when the changes for the better are being made not only for the producer, but for the user of harvesting machinery, notwithstanding the tirades of blatherskites and the political capital that demagogues may try to make out of trusts.

J. HENDERSHOT.

CHICAGO, November 20, 1902.

Fast German Vessels Self Supporting.

To the Editor: In the issue of your most interesting journal dated October 16 I find an article on pages 26 and 27 dealing with the Atlantic shipping trust. It is signed "S. G. H.," which, I presume, are the initials of your London correspondent.

Referring to the ridiculously liberal present which the British Government has made the Cunard Company, this gentleman says: "It is notorious that they [the fast liners] could have been built at any time. The British companies have hitherto declined to go beyond 22-knot boats on the ground that it was commercially unprofitable. The Germans have done so because the Government guarantee their dividend." This latter statement is a legend as old as the competition of the two magnificently managed German lines—Hamburg and Bremen—with the old established English companies. If your correspondent is well posted on the question he must have read time and again the press controversies about this matter in English as well as in the most respectable German papers. He ought to know, first of all, that General Director Ballin of the Hamburg-American Line in an official speech some weeks ago made the widely commented on statement that he would be glad if the German Government would stop paying the company the small subvention for mail steamers, which in reality was a burden to the steamship companies.

I have no doubt that you will be interested in correcting a statement which, if remaining uncontradicted, is liable to change the opinions of readers convinced of your impartiality. The public interested in the whole question of Atlantic shipping will, by the way, be astonished when the German companies publish their reports for 1902. They will then see that there does not exist such a thing as a guaranteed dividend.

Why should an Englishman, who is proud of the deeds of his forefathers as having been accomplished without Governmental help, not acknowledge the very same feelings in Germany? X. Y. Z.

HAMBURG, November 6, 1902.

Coatesville Boilers Used.

To the Editor: We note in the issue of *The Iron Age* for November 20 on page 25, under the heading "Mechanical Stokers for Steel Mill Service," the following statement: "A prominent example of this arrangement is offered in the plant of the Lukens Iron & Steel Company, recently described, which comprises 5700 horse-

power of Babcock & Wilcox water tube boilers equipped," &c. We beg to state in this connection that the boilers referred to in this quotation are all of the return tubular type, and were all built by us.

COATESVILLE BOILER WORKS.

NEW YORK, November 20, 1902.

OBITUARY.

FREDERICK ALFRED KRUPP.

Frederick A. Krupp, proprietor of the great works at Essen, Germany, died of apoplexy November 22, aged 50, after an indisposition of several days. He had been in delicate health for some years. Mr. Krupp was the third in the famous Krupp family. He was the grandson of Frederick Krupp, the founder of the gun works in Essen. His grandfather was an iron worker at Essen and saved his money until he had accumulated a few thousand marks; with which, in 1810, he went into business on his own account by starting a small foundry. For 16 years, with two or three helpers, he made a bare living, just managing to keep the small property, which formed the nucleus of

FREDERICK ALFRED KRUPP.

the big gun works. Alfred Krupp, son of the founder and father of the late Frederick, became the owner of the foundry in Essen in 1826. For years he struggled against odds to make a living. In 1832 he employed only nine men in his foundry. For a quarter of a century he turned out good steel and good guns, and at the end of that time was forced to sell a few pieces of silver plate to pay his workmen. The tide turned in 1851, when he took his steel and a gun or two to the World's Fair in London. Other nations promptly appreciated his products, and when, in 1855, Prussia gave him her first order he had more business than he could attend to. So rapidly did the demand for Krupp guns increase that Alfred Krupp could not enlarge the capacity of his factory fast enough to meet it. Alfred Krupp died July 14, 1887, in his seventy-fifth year. Since 1887 the entire control of the works has been in the hands of Frederick, who conducted the great steel plant as the worthy successor of a great father. He married the Baroness Margarette von Ende. He was not regarded as a hard master by his workmen. He established various institutions at Essen for their benefit, and built hundreds of model houses for their use, charging a moderate rental. Socialism, the bane of the workingman of Germany, gained no foothold at Essen, because of the very satisfactory conditions prevailing there. Mr. Krupp employed over 50,000 men, and although inclined to be reticent, was popular with this great body of workmen. Although somewhat overshadowed by the fame of his father, who was the developer but not the founder of the Krupp iron and steel industries, Frederick A. Krupp was one of the foremost living authorities on the science of steel making. He was an ardent experimenter and indefatigable in pursuing investigations for the purpose of simplifying the processes of manufacture. One of his latest searches in this direction was an attempt to produce a better article of its class than Harveyized steel for armor plate, in which he met a large measure of success. In the spring of this year, at the annual meeting in London of the Iron and Steel Institute, the Bessemer gold medal for scientific research was awarded him. This is one of the highest honors that can be paid to any man in the iron trade. The award was made to Herr Krupp for his discoveries in the manufacture of armor plate. The son was thus following in the footsteps of his great father. Krupp acquired coal mines in Germany and went to Spain for ores. He was a railway magnate of the first order, and embarked in the ownership of an industrial fleet, which kept pace at Kiel with the empire's ships of war. He leaves a widow and two daughters, and it is understood that the management of the works will be placed in the hands of a cousin, Arthur Krupp of Bernsdorf, a manufacturer of German silver ware. The will, according to a semi-authoritative statement, provides that the works shall not be turned into a joint stock company under 25 years. In the meantime the revenues of the whole property will go to the widow. Bankers estimate the estate at $75,000,000. Securities outside of the manufacturing plants may possibly amount to as much more.

GEORGE C. PETTIS.

George C. Pettis, treasurer of the Hoggson & Pettis Mfg. Company of New Haven, Conn., and a prominent business man of Hartford, Conn., died on November 20 at his home in that city, aged 69 years. He was born in Plymouth, Conn., and learned the machinists' trade at the Eagle Lock Works in Terryville. When 21 years of age he went to New Haven and entered the employ of the Davenport, Mallory Lock Company. Subsequently Mr. Pettis was connected with the Russell & Erwin Mfg. Company, at New Britain, with whom he remained for 17 years, then returning to New Haven, where he joined the Hoggson & Pettis Mfg. Company, makers of chucks and small machinery, which concern developed under his care into a large enterprise, whose goods are sent throughout the world. Mr. Pettis held a number of offices of trust and honor in New Haven.

CHARLES MOEHLMAN.

Charles Moehlman, foreman of the iron foundry of the General Electric Company, Schenectady, N. Y., died suddenly at his home in Schenectady, on Friday, October 31. Mr. Moehlman was born in Nittlestadt, Westphalia, in 1856, and after attending common schools until he was 14 years of age, he started in his father's foundry to learn the molder's trade. Attaining the age of 21 he had the usual term of three years' service in the German army. In 1882 he migrated to America and worked for four years in an iron foundry in Amsterdam, N. Y., and afterward worked in several other foundries until January, 1888, when he secured employment as molder with the Edison General Electric Company and continued in their employ until his death. He was appointed foreman of the iron foundry in 1895. A widow and six children survive him.

NOTES.

JOSEPH WOOD, a well-known foundryman and proprietor of a machine shop at Marine City, Mich., died on November 8, aged 63 years. He had been established in business in Marine City since 1866.

T. HENRY MASON, a large copper mine owner, died November 16 at his home in this city. Mr. Mason was one of the best known men in the copper mining industry. He was president of the Quincy Mining Com-

pany, which his father founded, and vice-president of the Adventure Consolidated Mining Company and the Rhode Island Copper Company. His father, Thomas F. Mason, was one of the first persons to go into the Superior fields, and the work he began his son ably continued. Born in Bristol, R. I., in 1845, he moved to New York with his parents 40 years ago. He was a prominent member of the New England Society, the Union League, the Lotos and the New York Yacht clubs. He is survived by a widow, but no other immediate family.

JOSEPH H. OUTHWAITE of Cleveland, Ohio, died suddenly on November 15, in Roosevelt Hospital, New York City, as the result of an operation. Mr. Outhwaite was born in Cleveland 62 years ago, and was one of the prominent business men of the city. He was connected with the iron industry all his life, and formed the firm of J. H. Outhwaite & Co. of Cleveland, who operate extensive iron mines in the Lake Superior region.

WILLIAM E. DAVIS, for many years superintendent in the Rogers Locomotive Works, at Paterson, N. J., died on November 13, at his house in Jersey City, aged 82 years. He was born in Ireland, but had lived in Jersey City nearly all his life. Since 1873 Mr. Davis had been engaged in the manufacture of electrical machinery, and was the inventor of a number of mechanical devices.

GEORGE H. CABBLE, one of the proprietors of the William Cabble Wire Company of Brooklyn, N. Y., died November 16, from typhoid fever at his home in Brooklyn, at the age of 33 years.

HON. CLIFTON C. BEACH, formerly president of the H. P. Nail Works, Cleveland, Ohio, died November 14, at his home in Rockport, Ohio, from a complication of diseases. Mr. Beach, who was 57 years of age, was born in Sharon, Ohio, but became a resident of Cleveland when 12 years old, remaining in that city all of his subsquent life. He was educated for the bar and became a successful lawyer. In 1884 he went into business with the H. P. Nail Works, and served as president of the concern for several years. He represented the Twentieth Ohio District in the Fifty-fourth and Fifty-fifth Congresses, and was one of the most prominent men in the public and business life of Cleveland.

Retort Coke Oven Plant at Cleveland.

A contract just entered into between the Retort Coke Oven Company of Cleveland, John F. Wilcox, general manager, and the Cleveland Furnace Company, provides for the erection in Cleveland at once of 66 retort coke ovens of the Otto-Hoffman type. The new plant is to be located on ground adjoining the blast furnace which the Cleveland Furnace Company now have under construction, the land being leased from the furnace company. Work on tracks and piling for foundations for the coking plant is already in progress. The plans contemplate a complete system, including apparatus for the recovery of by-products. The compression system of ramming the coal and introducing it into the ovens will be employed, making it possible to charge 8 tons of coal instead of 6 as in ordinary charging without ramming. The new method is in use at the Sydney, Cape Breton, plant, and is being installed at Lebanon and Buffalo by the Lackawanna Steel Company. Electricity will be the motive power for filling, pushing and other operations. Three gas engines will be installed of 160 horsepower each, and will be supplied with gas from the ovens. It is expected that the plant will be completed by the fall of 1903. Its output will be 350 tons a day, all of which will be taken by the Cleveland Furnace Company. Coal will come from a Monongahela River property of interests identified with the furnace company. In case a second blast furnace is added there is ample room for the doubling of the coke plant.

Requests for Catalogues.—The Eynon-Evans Mfg. Company of Philadelphia, Pa., advise us that they contemplate increasing their equipment, and are desirous to receive catalogues of engines, boilers, air compressors, pneumatic tools, pumps and shears.

MANUFACTURING.

Iron and Steel.

The Sligo Iron & Steel Company of Connellsville, Pa., with a capital of $250,000, are building a plant at that place for the manufacture of iron bars and plates. The new company have taken over the old firm of Phillips, Nimick & Co., who operated the Sligo rolling mills in Pittsburgh for nearly 50 years, and when the new enterprise has started the firm of Phillips, Nimick & Co. will cease to exist.

The Talbot open hearth furnace at the American Iron & Steel Works of the Jones & Laughlin Steel Company, at Pittsburgh, is again in operation, after being closed down for some little time to make some necessary changes. The steel turned out by this furnace is of excellent quality and it is expected the output will amount to between 300 to 400 tons daily.

Hyde Brothers & Co. of Pittsburgh, incorporators of the Clearfield Iron & Steel Company, are dismantling the plant formerly operated by the Richmond Iron & Spike Company, at Iron Gate, Va., and the machinery is being removed to the new plant of the Clearfield Iron & Steel Company, Clearfield, Pa.

The two Monongahela furnaces of the National Tube Company, at McKeesport, Pa., were idle part of last week, waiting for coke to arrive.

The new plant of the National Cable & Wire Company, at Wireton, on the Pittsburgh & Lake Erie Railroad, 18 miles from Pittsburgh, will be started next month. The company will make a specialty of insulated wire for all purposes and will also make all kinds of wire, from the finest copper thread for magnets to enormous cables for underground telephone mains.

The Pittsburgh Pipe & Iron Company, Allegheny, Pa., dealers in all kinds and sizes of second-hand pipe and scrap iron, intend to enlarge their plant and stock yards to double their present size.

The blast furnace of the La Belle Iron Works, at Steubenville, Ohio, which is being rebuilt, will be ready for blast about February next. This company are now operating their large plate mill and have entered some large orders. Three of the five furnaces in their new mill are in operation.

The United States Works of the American Tin Plate Company, at Demmler, Pa., have been started up. The plant contains 11 sheet and pair furnaces, six annealing furnaces and 11 hot and cold mills. Fourteen of the 23 mills in the Laughlin Works, at Martin's Ferry, Ohio, have started up. It is probable the entire 23 mills will go on before very long. The New Castle Works, at New Castle, Pa., which have been ide for some time, will be started up at an early date. This plant is one of the largest owned by the American Tin Plate Company and contains 20 pair and sheet furnaces, 7 annealing furnaces, 20 hot and 21 cold mills. The output is 40,000 gross tons annually of black plate for tinning and 16,000 weekly of tin and terne plate, running double turn.

It is possible that the Homestead, Edgar Thomson and Duquesne Works of the Carnegie Steel Company may be idle more or less in the next month on account of shortage of fuel and lack of motive power and cars. In case it is found necessary to close down any of these plants, advantage will be taken of the opportunity to make needed repairs.

The Board of Trade of Findlay, Ohio, have taken in hand the affairs of the Ohio Rolling Mill Company at that place and a new company are being organized to take over the plant and put it in operation. It is expected the mill will be started within the next few weeks.

Property owners between Tonawanda and Buffalo, on the western border of the State, are greatly excited over the rumored prospective establishment of another big steel plant at that point. Rumors are current that certain property has been sold to men prominent in the iron and steel field, but as yet the project is not well defined. The name of H. C. Frick of Pittsburgh is mentioned in connection with the subject.

The Royal Metal Steel Company, 17-23 Bridge street, New York, were incorporated to import and sell a special high grade tool steel, and if the business shall warrant it, they intend to manufacture the steel in this country.

The Kentucky Iron Company, Paducah, Ky., are putting Paducah Furnace into operation.

The Tidewater Steel Company of Chester, Pa., are having installed in the open hearth department a 90-ton electric crane. They have recently added eight new coke ovens in the steel billet mill.

It is announced that the Coxey Steel Works of Mt. Vernon, Ohio, which was placed in the hands of a receiver some time ago, is showing good earnings, and that the receiver expects by April 1 to pay 50 per cent. on claims for labor and work. These claims are said to aggregate about $65,000. Work on the new plant is being pushed and it will be completed about the first of the year, at which time a large amount of work can be taken care of and the earnings will be greatly increased. It seems quite probable that the plant will be turned back to the directors some time next year.

The report that the Burden Iron Company of Troy, N. Y., are increasing their rolling capacity is without foundation. The company are, however, introducing a number of labor saving devices, and not having sufficient room to accommodate these in their old rolling mill building, they are erecting an annex. They are also erecting a Weiss condenser of sufficient capacity to take care of the engines of their entire plant.

General Machinery.

The General Automobile & Mfg. Company, Cleveland, are established in the factory formerly owned by the O. P. Clay Stampings Company, and they are preparing to increase their output to two automobiles per day. They have recently placed orders for a Binsse No. 1 boring mill, two No. 4½ Bardons & Oliver screw machines, one No. 3 Brown & Sharpe gear cutting machine and one large Gray planer.

The Cleveland Machine & Mfg. Company, Cleveland, are erecting an addition to their forging department, in which they will install a large steam hammer.

The season for beet sugar plants has opened and the Kilby Mfg. Company, Cleveland, who make a specialty of this class of work, have closed two important contracts. One of them is for a 1000-ton house for the Owosso Sugar Company of Owosso, Mich., and the other is for a 1200-ton house for the Ft. Collins Sugar Company, Ft. Collins, Col. The latter will be one of the largest plants ever built in this country. In addition to the sugar working machinery which the Kilby Company will furnish, they will require from 12 to 15 250 horsepower water tube boilers, a 500 horse-power engine and a lighting plant for each house; also a complete machine shop, consisting of lathes, planers, pipe cutting tools, &c. Each house will require about 500 tons of structural work, and the difficulty in securing this promptly presents a somewhat embarrassing problem. The company have several other important contracts pending.

The Acme Machinery Company, Cleveland, are moving into their new office building, and their old offices will be used for manufacturing purposes, increasing their floor space considerably. The company are extremely busy on their regular lines of machinery. In line with other manufacturers of bolt and nut machinery, they have recently announced a slight advance in prices.

The R. S. Newbold & Son Company, Norristown, Pa., have added 25 x 75 feet to their machine shop, to accommodate a new 10 x 10 x 24 foot planer. The company have just completed a plant in New England for making 100 tons per day of briquettes from lean coal in that part of the country.

The Packard Motor Carriage Company of Warren, Ohio, have commenced work on a large power house and two new buildings, which will be used for machine shop and erecting shop. The company are increasing their facilities for the production of gasoline automobiles and expect to install considerable new machinery when the new shops are completed. They are making shipment of a number of automobiles to a San Francisco dealer.

The Detroit Southern Railroad Company have secured concessions from the municipal authorities of Napoleon, Ohio, and will remove their shops and division headquarters to that place. New buildings to be erected will include a general repair shop, round house and train dispatcher's office.

The Berg Automobile Company of New York are having the working parts of their machines built in the factory of the Cleveland Automatic Machine Company of Cleveland. The Berg Company were recently founded by Robert Gardine and J. Berg of New York, who have made a study of French gasoline automobiles and who have secured French patterns and parts with a view of manufacturing the French type of machine in this country.

The Elyria Iron & Steel Company, who are erecting a large plant at Elyria, Ohio, have placed a contract with the Marshall & Huschardt Machinery Company for their complete shop equipment, and with the Strong, Carlisle & Hammond Company, Cleveland, for motors with which to drive all tools. Among the machine tools purchased were a 42-inch Cincinnati planer, a Bickford universal radial drill, a Lodge & Shipley 36-inch lathe, a Gould & Eberhardt shaper and a large steam hammer to be built by the American Engineering Works.

The Reade Machinery Company, American Trust Building, Cleveland, have purchased 6 acres of land near the new Lake Shore shops at Collinwood, Ohio, and they are breaking ground for a building and office, 60 x 150 feet, where they propose to carry a large stock of second-hand machinery. A portion of the shop will be equipped for rebuilding and renewing second-hand machine tools, hoisting engines, boilers, locomotives, contractors' and other varieties of machinery. There will be a switch into the yard and a crane will be installed. Hereafter the Reade Company will handle only the heavier grades of machinery.

The Borden Machine Company of Warren, Ohio, are erecting an addition to their machine shop, which will more than double their capacity. The company are far behind on their orders for their special machinery.

Hon. Sam Jones, the famous non-partisan mayor of Toledo, Ohio, is said to have decided on a project for establishing a co-operative industrial establishment on the outskirts of Toledo. Mayor Jones is at the head of the Acme Sucker Rod Company, and their present quarters in Toledo are said to be altogether too small to take care of the business. The plan is to establish a factory for the Sucker Rod Company; also a foundry for the production of castings to be used by the company. Surrounding the plant it is proposed to erect model homes for the working men, with a park, town hall, amusement hall, gymnasium and other features.

The recently organized Foundry & Machine Company, at Bellfontaine, Ohio, have secured 17 acres of ground on the Big Four and Ohio Central railways in that city. Plans for the plant have been completed and work will commence at once. The buildings will be of modern construction and consist of brass and gray iron foundry, machine and erecting shops, forge shop and power house, pattern making department, office and drafting rooms. The company will conduct a general jobbing business, and will bring out a line of special machines in hydraulic and pneumatic power.

It is said that the machine shops of the Baltimore & Ohio Railroad, at Parkersburg, W. Va., are to be very much enlarged.

A charter has been granted to the Shenango Machine Company of Sharon, Pa., with a capital of $60,000. The company are an identified interest of the Sharon Steel Company and will operate a foundry and machine shop. The incorporators are: F. A. Buhl, Samuel McClure, Joseph Riddell, Michael Kennedy and Daniel Eagan.

The Diescher Coupling Company of Pittsburgh have practically completed the special machinery and equipment necessary for the manufacture of all sizes of the patent Diescher shaft couplings, and are waiting for the completion of patterns and castings before placing them on the market, which will be not later than January 1, 1903. The company are making a specialty of feed tables for mills, all machinery for the manufacture of corks, and the designing and building of special machinery, as well as any work calling for a high class of machine work. They are at present engaged in building a specially designed shear for cutting zinc bars for the Lanyon Zinc Company, Iola, Kan.

The Noble & Wood Machine Company, Hoosick Falls, N. Y., have completed the rebuilding of their plant, which was destroyed by fire last March. The new plant is considerably larger than the old one and is better equipped in every way, and the company are prepared to fill all orders for paper mill machinery.

The Saco & Pettee Machine Shops, Biddeford, Maine, are considering the erection of another large addition to their plant.

The Chas. A. Stickney Company, Incorporated, St. Paul and Minneapolis, are building a two-story brick machine shop at Sharkey and Fillmore streets, St. Paul. The estimated cost of the building is $8000.

The Vilter Mfg. Company, Milwaukee, Wis., have recently closed contracts for the following refrigerating machines, ranging from 12 to 350 tons capacity, as follows: Schermerhorn-Shotwell Company, Des Moines, Iowa; Rock Island Brewing Company, Rock Island, Ill.; Cosmopolitan Hotel, New Orleans, La.; Standard Brewing Company, New Castle, Pa.; Pittsburgh Brewing Company, "Iron City Brewery," Pittsburgh, Pa.; Fred. Sehring Brewing Company, Joliet, Ill.; Middle West Brewing Company, Joplin, Mo.; New Kensington Brewing Company, New Kensington, Pa.; American Brewing Company, Bennett, Pa.; Goenner & Co., Johnstown, Pa.; Oliver Chilled Plow Works, South Bend, Ind. Corliss engine sales include the following: Gutmann & Co., Chicago, Ill.; Wausau Paper Mills, Brokaw, Wis.; Lamar Light & Water Company, Lamar, Mo.; City Water & Light Department, Fort Atkinson, Wis.; Ewart Building, Chicago, Ill.; Hilgen Mfg. Company, Cedarburg, Wis.; Rock Island Sash & Door Works, Rock Island, Ill.; Boland & Geschwind Company, Limited, New Orleans, La.

The National Iron Company of Duluth, Minn., have recently installed in their forge department a new 2000-pound steam hammer capable of forging a 16-inch shaft. The total weight of the machine is 17 tons and it was made by the American Engineering Company of Chicago. With this addition to their equipment the National Company will hereafter do their own molding instead of buying shafts already formed, as heretofore.

The Liberty Chuck & Wrench Company, Middletown, Conn., have incorporated with a capital stock of $125,000.

The Bird Machine Mfg. Company have incorporated with a capital stock of $125,000 for the manufacture of a general line of machinery. Address C. H. Tebbetts, Salem, Mass.

George C. Keene & Co., manufacturers of cornice and roofing machinery, have built a new plant in Cincinnati, Ohio. The new shops include a main building 30 x 88 feet, in which the heavy erecting and finishing work is done, an 11-ton traveling crane enabling the larger castings to be handled. The machine shop measures 60 x 80 feet, in which has been installed modern machine tools especially adapted to the production of cornice brakes and machinery for entire roofing plants. A 20 horse-power Watkins gas engine supplies the power. Among the orders recently shipped and in course of production by the com-

pany are the following: A large 10-foot double corrugating machine for the New York Iron Roofing & Corrugating Company of Jersey City, N. J.; two 10-foot corrugating rolls for the Philadelphia plant of the Wheeling Corrugating Company, an entire outfit for the Kentucky Iron Roofing & Corrugating Company at Covington, Ky., and a complete outfit for the new plant of the Wheeling Corrugating & Roofing Company, at Martinsville, Ohio.

Boilers, Engines, &c.

A new warehouse and a foundry addition, 30 x 150 feet, are being built by the Buffalo Pitts Company, Buffalo, N. Y., manufacturers of engines, threshing machinery, &c. They are also installing electrical machinery ordered from the General Electric Company, which will be operated supplementary to their steam plant.

The James D. Lalor Engineering Company, Philadelphia, have invited estimates for a new plant for the Westmoreland Boiler Company, to be erected in New Kensington, Pa. The plant will be of brick and steel and will include a foundry, 50 x 275 feet, machine shop, 50 x 80 feet, cleaning house, 30 x 50 feet, boiler and engine house, 38 x 76 feet, core house, 50 x 175 feet, and a three-story storage house, 40 x 75 feet. It will be lighted by electricity and will be operated by 32 electric motors. The equipment will consist of two 175 horse-power water tube boilers and engines, direct connected to 75-kw. generators; steam pumps, air compressors, pneumatic and electric cranes, and all modern foundry and machine shop appliances.

The Kansas City *Star*, Kansas City, Mo., require two 150 horse-power engines for their new paper mill.

The Phœnix Iron Works, Meadville, Pa., manufacturers of boilers and engines, have completed their new boiler shop, 75 x 300 feet. The old boiler shop will be cleared away and the ground used for an addition to the foundry. The company have a large number of orders on hand, including one just received from the Illinois Steel Company for two compound engines. They have recently installed a pair of compound engines for the Penn Iron & Coal Company, at Canal Dover, Ohio.

The McNeil Boiler Company of Akron, Ohio, have been granted a charter of incorporation. The new company will take over the business of McNeil & Brother, manufacturers of boilers.

Douglass G. Flanner of Toledo and J. Wildman of Bay City, Mich., are at the head of a company who will erect a boiler works on Water street, Toledo. A site has been purchased and the building will be 70 x 80 feet. The company will make a specialty of marine repair work and the shop will be equipped for the heaviest class of work. Heavy punches will be installed and pneumatic tools will be used. The plant will be ready for the winter repair season for lake vessels.

The Standard Pump & Engine Company of Cleveland have been incorporated with $10,000 capital stock by John M. Marty, Jr., Virgil J. Terrell, George B. Marty and Wm. W. White. They will manufacture gas engines.

The Mesta Machine Company of Pittsburgh, through their Southern agents, Shook & Fletcher, have sold six additional long crosshead type blowing engines in the Birmingham district. These engines are 44 x 84 x 60 inch high pressure and 84 x 84 x 60 inch low pressure and will be arranged to work compound.

A company are being formed in Denver, Pa., at the head of which is Dr. W. D. Fink, for the purpose of erecting a new electric light plant. A franchise has been asked for, and we are informed that it will be granted shortly. An engine of from 80 to 100 horse-power, dynamo and accessories will be required.

The municipality of Harrodsburg, Ky., have voted $18,000 bonds for an electric light plant and $48,000 for water works. J. Hal. Grimes is Mayor.

Complete power plant equipment and electric motors are required by L. H. Best & Co., Newark, N. J., for the new underwear factory they are to erect at Central avenue and Second street.

Foundries.

The L. H. Goodnow Foundry Company, Fitchburg, Mass., are making a specialty of casting and turning engine fly wheels in sizes from 6 to 20 feet. The manufacturers state that these wheels are notable for accuracy and perfection of finish and that their facilities enable them to make quick deliveries. Their machine shop is equipped with latest improved tools for this work and they also have a modern foundry and are prepared to furnish all kinds of gray iron castings.

The Girard Foundry & Machine Company of Girard, Ohio, have increased their capital stock from $10,000 to $25,000, and are preparing to enlarge their plant.

The Philadelphia Foundry & Machine Works, Philadelphia, have about completed the rebuilding of that portion of their plant recently destroyed by fire. A good amount of business is on hand and shipment of a number of heavy iron castings has recently been made, among which was a 22½ ton engine bed for a Western concern, a 17½-ton engine cylinder and several castings weighing over 15 tons for local parties.

It is stated on good authority that an effort is being made to organize another steel casting company at Chester, Pa., The promoters of the scheme are John T. Dickson, formerly connected with the Penn Steel Casting & Machine Company, and William S. Logan, of a well-known pattern making firm of that city. The capital of the new company according to the plans of the projectors is to be $250,000, and with this amount it is proposed to buy a site and build a plant of moderate dimensions with the best equipments for handling almost any kind of work.

At a recent meeting of the stockholders of the Malleable Iron Range Company of Beaver Dam, Wis., it was decided to raise the face value of the shares of stock to $100 and to assess the original stockholders on the additional amount. The capital stock represented by this increased valuation of shares, amounting to $17,950, and 282 shares of unissued stock which were purchased by Fred W. Rogers of Quincy, Ill., and Andrew G. Hill of Wausau, Ill., at $100 per share, will be used in enlarging the plant and increasing the output of the company.

The Wilkes Foundry Company of Toledo, Ohio, have purchased eight acres of land adjoining their present plant, and extensive improvements will be made at once. One hundred feet will be added to the present main building, and another building 160 x 500 feet will be erected. The latter building will be for molding machinery exclusively and the company will soon be in shape to turn out castings up to 40 tons and over. The plant will be equipped with modern machinery and much of it will be electrically driven. The Wilkes Company have enjoyed phenomenal success since they started.

The Sandusky Foundry & Machine Company, Sandusky, Ohio, have succeeded the Co-operative Foundry & Machine Company in that city. The company have been incorporated with $50,000 capital stock under a West Virginia charter, and the incorporators were: James J. Hinde, W. F. Ross, Sidney Frohman, J. J. Dauch and George Blackford. William H. Willspaugh of Salem, Ohio, will be general manager and N. C. McCloud of Holyoke, Mass., superintendent of the company. The company will manufacture machinery and pumps and do foundry work of all kinds. The plant will be improved and new machinery installed.

The Royal Stove & Range Company, Greenfield, Ohio, are erecting a plant which they expect to have in active operation about the first of next April. The main building will be 86 x 130 feet, three stories in hight; the foundry will be 76 x 121 feet, with cupola room, 24 x 24 feet, molding room, 25 x 30 feet, and engine and boiler house, 40 x 40 feet. The buildings will be of stone and brick and the machinery with which they will be equipped of the latest design.

The Eaton, Cole & Burnham Company, manufacturers of valves, pipe fittings, pipe cutting and threading machines, &c., are making some important additions to their plant at Bridgeport, Conn. The new buildings include an iron foundry, 330 x 120 feet in area; tumbling room, 54 x 120 feet; core room, 160 x 60 feet; pattern safe, two stories high, 180 x 60 feet; power house, 67 x 42 feet; making a total floor space of over 80,000 feet in the South avenue plant alone, while the plant at Water and Main streets has approximately 200,000 feet of floor space.

The Walter J. Scully Ventilator Company, Detroit, Mich., are about to erect a new foundry. The company were incorporated a few months ago with a capital of $150,000 by Walter J. Scully and J. N. Teahan of Detroit and William Delano of Grand Rapids.

Bridges and Buildings.

The United Engineering & Contracting Company, New York, have completed the temporary bridge over Newtown Creek, and traffic will very shortly be diverted to Oakland avenue from Vernon avenue, during the construction of the permanent bridge, which will be of Scherzer type, and the viaduct leading to it will carry the traffic over the tracks of the Long Island Railroad Company in Long Island City. A perfectly good, hand power, center swing, highway bridge, with double trolley tracks in place, is thus put out of use and for sale to any one who may need such a structure for quick delivery.

The Lake Shore & Michigan Southern Railway Company have placed a contract with the Massillon Bridge Company, Massillon, Ohio, for a large steel bridge to be erected at Toledo.

Fires.

The breaker of Furnace Colliery, owned and operated by Gerber & Seaman, at Maizeville, Pa., was destroyed by fire November 21.

Hardware.

The Ohio Steel Wheelbarrow Company, Toledo, have been incorporated with $50,000 capital stock by J. Franklin Zahn, George C. Cone, Joseph N. Crowley and Frants Z. Cooper. They will manufacture steel wheelbarrows.

The Grand Rapids Hand Screw Company, Grand Rapids, Mich., are building an addition to their plant in the shape of a three-story and basement brick building, 60 x 86 feet, which will cost when completed about $12,000.

H. B. Black & Co., Chester, Pa., manufacturers of Wm. Beatty & Sons' edge tools, have within the past year, by the introduction of new presses, punches and hammers, increased their output 25 per cent., and are now contemplating a further addition to their works, which will enlarge their capacity at least as much more. This increase in production is owing to the large demand for their tools, which overtaxed their former facilities.

The Iron and Metal Trades.

The event of the week has been the merger of the Union Steel Company and the Sharon Steel Company. The consolidation thus accomplished will make the new organization one of the leading factors in the Steel trade, particularly in the production of Wire Rods and Wire products. It is intimated that the consolidation plan proposes the taking over of several other properties, presumably in the Wire trade. The new company will not only be in possession of the most modern appliances for production, but will at the same time control an adequate supply of raw material. They will also build a railroad to Lake Erie, which will enable them to transport their Ore at minimum rate.

The drift seems to be toward the concentration of business in the hands of the larger companies, especially in Steel products. The scarcity and high prices of raw materials, together with the reduction in the finished product, have diminished the output of the smaller producers, who do not control their raw materials, and the larger companies are therefore securing a much greater share of current business than a short time since.

Heroic efforts have been made by the railroad companies to relieve the congestion of freight in and about Pittsburgh. This has improved the situation at that point, but at the same time it has not tended to the improvement of affairs at other points at which a great deal of freight is distributed. Complaints are numerous of the slowness of deliveries in other localities and particularly in the East. Manufacturers are finding great difficulty in supplying their customers with material in reasonable time.

The Coke famine continues as serious as in previous weeks. The attempts to move more Coke from the Connellsville region have been successful to some extent, but it is now stated that the production of Coke is not equal to the demand. Very high prices are being paid by furnaces and foundries short of fuel. In this connection it is stated that foundrymen will be obliged to materially advance the prices of Castings next year. It is not expected that Pig Iron will be any lower for several months than the prices prevailing during the past few weeks for delivery the first half of next year. These prices will make foundry mixtures considerably higher than during the year now drawing to a close. It must be noted, however, that spot pig iron is much easier in the Central West. The heavy premiums recently paid can no longer be obtained.

Cables from abroad state that the Steel Market is active for prompt delivery, the demand being better from European consumers. Prices for importation have been advanced from 50c. to 75c. per ton for December shipment, but for future delivery as low as $26, New York, cargo lots, is said to be made. The demand from American consumers has recently been rather light, although some transactions were put through during the week, including 8000 tons for the Chicago district.

A matter of some interest is the appearance of Belgian structural manufacturers as bidders on work now coming up in the Gulf States. They show willingness to take contracts for early delivery involving penalties.

Consumers of Iron and Steel will shortly be called upon to face an advance in freight rates. This is partly due to the recent advance in railroad employees' wages, but is also claimed to be a restoration of reduced rates to those usually prevailing in normal times.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Nov.26, 1902.	Nov.19, 1902.	Oct.29, 1902.	Nov.27, 1901.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	*$23.50	*$23.50	*$22.50	$15.50
Foundry Pig No. 2, Southern, Cincinnati	*22.25	*22.25	*22.25	14.25
Foundry Pig No. 2, Local, Chicago	*23.00	*23.00	*23.00	15.00
Bessemer Pig, Pittsburgh	*21.75	*22.00	*21.75	16.00
Gray Forge, Pittsburgh	*20.75*	*21.00	*21.75	14.75
Lake Superior Charcoal, Chicago	†26.00	*26.00	*26.00	17.00
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	*28.50*	28.00	29.50	27.00
Steel Billets, Philadelphia	†*26.00*	†26.50	†27.50	29.00
Steel Billets, Chicago	†**29.50**	†29.00	†29.00	....
Wire Rods, Pittsburgh	35.50	35.50	36.00	35.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	*18.75*	18.75	19.00	14.00
O. Steel Rails, Philadelphia	*21.00*	21.00	21.50	17.50
O. Iron Rails, Chicago	*24.50*	24.50	25.00	21.00
O. Iron Rails, Philadelphia	*24.00*	24.00	24.50	21.50
O. Car Wheels, Chicago	24.00	24.00	24.00	15.50
O. Car Wheels, Philadelphia	**20.00**	20.00	19.00	16.00
Heavy Steel Scrap, Pittsburgh	....	21.00	....	....
Heavy Steel Scrap, Chicago	18.50	18.50	18.50	13.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.92½	1.85	1.92	1.65
Common Iron Bars, Chicago	1.75	1.75	1.80	1.65
Common Iron Bars, Pittsburgh	*1.70*	1.70	1.80	1.55
Steel Bars, Tidewater	1.75	1.75	1.75	1.70
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.50
Tank Plates, Tidewater	2.10	2.10	2.10	1.75
Tank Plates, Pittsburgh	*1.85*	1.75	1.90	1.60
Beams, Tidewater	2.00	2.00	2.00	1.75
Beams, Pittsburgh	*2.00*	2.00	2.10	1.60
Angles, Tidewater	2.00	2.00	2.00	1.75
Angles, Pittsburgh	*1.95*	2.00	2.00	1.60
Skelp, Grooved Iron, Pittsburgh	1.92½	1.92½	1.95	1.80
Skelp, Sheared Iron, Pittsburgh	2.05	2.05	2.05	1.85
Sheets, No. 27, Pittsburgh	2.65	2.65	2.65	3.00
Barb Wire, f.o.b. Pittsburgh	2.45	2.45	2.45	2.90
Wire Nails, f.o.b. Pittsburgh	1.85	1.85	1.85	2.15
Cut Nails, Mill	2.05	2.05	2.05	2.05
METALS:				
Copper, New York	*11.25*	11.40	11.75	16.75
Spelter, St. Louis	*4.87½*	5.05	5.20	4.15
Lead, New York	4.10	4.10	4.10	4.37½
Lead, St. Louis	3.97½	3.97½	4.00	4.25
Tin, New York	*24.25*	25.12½	26.75	33.00
Antimony, Hallett, New York	7.25	7.25	7.75	8.37½
Nickel, New York	40.00	40.00	40.00	60.00
Tin Plate, Domestic, Bessemer, 100 lbs., New York	*3.79	*3.79	4.19	4.19

* For 1903. † Foreign.

Chicago.

FISHER BUILDING, November 26, 1902.—(*By Telegraph.*)

Probably the most prominent feature of the situation is the sentiment developing in Pig Iron favoring lower prices, especially for spot and nearby delivery. The larger deliveries of both domestic and foreign Iron and the freer offerings, especially of the latter, are making more and more impression. There is still some irregularity, but as a rule the tendency is especially toward a more settled and therefore satisfactory market. The inquiry for Steel Billets, too, is reviving, some sales of moment on Chicago account having been made in the East and negotiations are pending for considerable tonnage at points west of Chicago. The market for Bars, both Steel and Iron, has not improved materially. One of the most important features of general interest is that heavy contracts for cars are pending, it being estimated that orders involving fully 25,000 cars are being offered by the various transportation lines; but with car companies so far sold ahead little relief can be expected from such business for months and months to come. It is notable that the congestion of traffic is not more complained of in the West by manufacturers of finished products than in the East, while raw material seems to be coming forward with much more expedition than has been the case for many weeks. It is notable that there is a more settled feeling in Wire and Nails and such products, the prices for which were reduced recently, the movement on old contracts and the tonnage of new business being way in advance of the corresponding period last year. Keen competition still results in the shading of official prices on Sheets and Merchant Pipe, but otherwise there seems to be a much more confident tone. While the wants of heavy consumers of Standard Rails seem

to have been largely taken care of, the aggregate tonnage offering by small buyers is considerable, while the demand for Light Rails is almost as pressing as heretofore. Certain grades of Old Material seem to be yielding slightly, but the market is maintained largely by light offerings. Old metals have declined and Coke has been more freely offered, with contracts made for next year at lower prices.

Pig Iron.—The easier feeling developed in the market for spot Iron noted a week ago has also been apparent during the past week, there being freer offerings, especially from the South, but probably the most influential factor has been the increased supply of foreign Iron available for both present and future deliveries. Deliveries, too, on contracts have continued to be made more satisfactorily. While there is still some irregularity in prices the tendency is more and more toward a settled condition and a more uniform basis. This is especially true of Foundry grades. Basic Iron has been more unsettled than other grades, prices varying over $1 a ton on the same grade of Iron. While standard Bessemer has sold in a few 100-ton lots at $26.25 to $26.50, there have been freer offerings ranging from $25.15 to $25.85, delivered, Chicago, and foreign Iron of this grade has been available at $23, Chicago. As near as can be determined the prices current for Southern Coke Iron, based on No. 2 Foundry, Birmingham, are $22 for spot, $21.50 for November and December, $21 for January and February, $20 for the first half and $19 for the third quarter of 1903, although some sales have been made at within 50c. a ton of these prices. Transactions have been largely of car lots and 100 to 200 tons, but there have also been contracts placed for various amounts ranging from 500 to 1200 tons. The fact that some Malleable concerns have closed temporarily rather than pay the higher prices current may have had some influence in creating sentiment, but the larger supply of foreign Iron was most effective. The inquiry for 20,000 tons of Mill grades for the first half of 1903 noted last week has been satisfied only to a moderate extent on the basis of $15 to $15.50, Birmingham. As a rule, however, 50c. to $1 per ton above these prices is demanded. Some local furnaces are said to be in better condition, having accumulated considerable fuel recently, and prospects are now favorable for the resumption of a few of these stacks in the near future. For the time being, however, local Iron continues scarce. There has been a more ample supply of Foundry Coke also and prices have yielded slightly for early delivery. The one discouraging feature of the moment seems to be the inadequate transportation facilities, but this is now felt rather more in the movement of the finished product than in raw material. There has been less demand for Silvery Iron and less extreme prices have been paid or demanded. The following are the prices current for the first six months of 1903:

Lake Superior Charcoal	$26.00 to $27.00
Local Coke Foundry, No. 1	23.50 to 24.00
Local Coke Foundry, No. 2	23.00 to 23.50
Local Coke Foundry, No. 3	22.50 to 23.00
Local Scotch, No. 1	24.00 to 24.50
Ohio Strong Softeners, No. 1	27.50 to 28.00
Southern Silvery, according to Silicon.	25.15 to 29.15
Southern Coke, No. 1	.... to 24.65
Southern Coke, No. 2	.... to 24.15
Southern Coke, No. 3	.... to 23.65
Southern Coke, No. 1 Soft	24.15 to 24.65
Southern Coke, No. 2 Soft	23.65 to 24.15
Foundry Forge	22.15 to 22.65
Southern Gray Forge	19.65 to 20.15
Southern Mottled	19.15 to 19.65
Southern Charcoal Softeners, according to Silicon	27.15 to 27.65
Alabama and Georgia Car Wheel	29.15 to 29.65
Malleable Bessemer	24.00 to 24.50
Standard Bessemer	23.00 to 23.50
Jackson County and Kentucky Silvery, 6 to 8 per cent. Silicon	28.00 to 30.00

Bars.—The market for Bar Iron has been quiet, with moderate sales, mainly at 1.75c., base, Chicago, although the full range of prices has been from 1.70c. to 1.80c., the outside rate being exceptional. Most of the sales have been in single car lots only, but one lot of 2500 tons has been placed by car works. The demand for Soft Steel Bars has also been only moderate, but there has continued to be better specifying on old contracts and a fair distribution movement. Hoops and Bands have shown but little, if any, improvement. The following are the prices current: Soft Steel Bars, 1.75c. to 1.80c.; Hoops, 2.15c. to 2.25c.; Angles, 1.85c. to 1.90c., base, mill shipment. The demand from store has been only moderate, but prices have not changed essentially, Bar Iron selling at 2.15c.; Soft Steel Bars, 2c. to 2.25c.; Angles at 2.50c., and Hoops at 2.40c., base, from store.

Structural Material.—The general tenor of the market has not changed essentially. There have been fair orders for local buildings running from 100 to 1500 tons placed at a liberal premium for mill shipment within the next 60 days, and some few contracts for later delivery next year. There has been some inquiry for foreign material, but only small contracts have been placed. For domestic Steel, mill shipment, prices are as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 2c. to 2.25c. It should be remembered that the inside prices, although official, are little better than nominal, being current only for indefinite deliveries, the outside prices representing the premium established over the official quotations for definite deliveries The movement from local stocks has been very light during the last week, but the market has continued firm at full prices. The following are the prices current: Beams and Channels, 2.50c. to 3c.; Angles, 2.50c. to 3c., and Tees at 2.55c. to 3.50c. at local yards.

Plates.—Aside from the placing of one contract for 12,000 tons for delivery during the late months of next year, there have been no developments worthy of special note. The market, of course, is and has been very strong, with full prices readily realized, the inside quotations being for indefinite deliveries only. The following are the prices current: Tank Steel, ¼-inch and heavier, 1.75c. to 2.10c.; Flange, 1.85c. to 2.10c.; Marine, 1.95c. to 2.20c. There has been less inquiry for small lots from local yards, but stocks are light and full prices are readily obtained as follows: Tank Steel, ¼-inch and heavier, 2.25c. to 2.50c.; Tank Steel, No. 8, 2.35c. to 2.55c.; Flange, 2.50c. to 2.65c., all fo.b. warehouse, Chicago.

Sheets.—There has been a fair movement, and the market is less unsettled, but there is still some irregularity due to the keen competition which has not been entirely eliminated. The following are the prices current for Black Sheets, mill shipment, carload lots, f.o.b. Chicago: No. 20, 2.55c. to 2.60c.; Nos. 22 and 24, 2.60c. to 2.70c.; No. 26, 2.70c. to 2.80c.; No. 27, 2.80c. to 2.90c.; No. 28, 2.90c. to 3c. For small lots from store the usual premiums above quotations are obtained. The competition in Galvanized Sheets is more apparent than in Black, and discount on the base price of 75 and 10 per cent. is made, but the following are the net prices: No. 27, 3.25c. to 3.50c. for mill shipment, and small lots from store at 3.40c. to 3.65c., Chicago.

Cast Pipe.—There has been an unexpected improvement in the demand in small amounts for the smaller sizes, mainly from the West, and the market has continued firm at the following prices: 4-inch, $37; 6-inch, $36; 8-inch and upward, $35; Gas Pipe, $1 per ton higher, f.o.b. Chicago.

Billets.—There has been a more active movement in foreign Billets, with sales made in the East on Chicago account of about 8000 tons at prices ranging from $27 to $27.50 on the Atlantic seaboard. Negotiations are pending on 12,000 tons at $29.50, duty paid, delivered at points west of Chicago. The demand for domestic Billets is largely confined to small lots, ranging from carloads to 100-ton lots, and in nearly all instances for prompt shipment. Prices for domestic Open Hearth Billets range from $36 to $40, according to analysis, buyer and time of delivery. For small lots a premium is obtained. Rerolling Billets are quotable at $31 to $32, mill shipment, Chicago.

Merchant Pipe.—While there has been no special animation, there has been a fair volume of business, the policy of protecting customers resulting in a more settled feeling, but competition is still keen, and it is rumored that independent mills are cutting jobbers' discounts made by the largest interest by 5 per cent. The following are the current base discounts, net, random lengths, for mill shipment, f.o.b. Chicago, carloads only:

	Steel Pipe.		Guaranteed Wrought Iron.	
	Black. Per cent.	Galvd. Per cent.	Black. Per cent.	Galvd. Per cent.
⅛ to ⅜ inch	66½	56½	63½	53½
½ inch	68½	58½	65½	55½
¾ to 6 inches	73½	63½	70½	60½
7 to 12 inches	71½	61½	68½	58½

Orders for less than carloads are charged at 12½ per cent. advance. Extra and double extra strong, cut lengths, lower random discounts by 10 per cent. net for 6 feet and longer and 15 per cent. net for 3 to 6 feet.

Boiler Tubes.—The market has been without animation and barely steady, the following prices being subject to an additonal discount of 5 per cent.:

	Steel.	Iron
1 to 1¼ inches	43½	38
1¾ to 2½ inches	56	36
2¾ to 5 inches	61	46
6 inches and larger	56	36

The demand for shipment from store has fallen off, but prices have been sustained, the following schedule of discounts being in force:

1 to 1½ inches	35	35
1¾ to 2½ inches	47½	32½
2¾ to 5 inches	55	42½
6 inches and larger	47½	..

Merchant Steel.—The general situation has not changed materially, there being some little new business and quite a fair movement on old contracts. Specifying by agricultural manufacturers continues quite liberal, but there is less demand for Crucible Steel and Cold Rolled Shafting. This, however, is not significant, being incidental to this season only. For mill shipment prices are as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.95c. to 2.10c.; Open Hearth Spring Steel, 2.65c. to 2.75c.; Toe Calk, 2.25c. to 2.40c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 47 off in carload lots and 42 off in less than car lots. Ordinary grades of Crucible Tool Steel are quoted at 6c. to 7c. for mill shipment; specials, 12c. upward.

Rails and Track Supplies.—While the demand for round lots of standard Rails for next year's delivery seems to have been largely satisfied there is still an active inquiry

for small amounts ranging from 1000 to 9000 tons, the aggregate of which tonnage is considerable. Business of this character is expanding. Official prices for domestic Rails continue strong at $28 for standard and $27 for second quality, mill shipment. Many of the second quality Rails made are being rerolled into Light Sections, the demand for which is urgent, Light Sections selling at from $35 to $45 readily. Track Supplies continue active and strong at the following prices: Splice Bars or Angle Bars, 2c.; Spikes, 2.50c.; Track Bolts, with Hexagon Nuts, 3.10c. to 3.45c.; Square Nuts, 2.95c. to 3.10c.

Old Material.—A somewhat easier tone has been developed in Railroad Wrought, Busheling and Machine Shop Turnings, but otherwise the market has changed but slightly during the week. Mills are ready buyers within the limit of quotations, but any higher prices demanded check business somewhat; still the offerings are only moderate. Old Car Wheels continue especially scarce and are wanted. The only transaction that seems to have come to the surface during the week is about 500 tons sold on the basis of $24, Cleveland. The demand for Relaying Rails has continued active, but the offerings have been very light. Sales of 500 tons 60-lb. have been made on the basis of $32.50, Chicago. The following are the prices current per gross ton, Chicago:

Old Iron Rails	.... to $24.50
Old Steel Rails, mixed lengths	$18.75 to 19.00
Old Steel Rails, long lengths	23.50 to 24.50
Heavy Relaying Rails	32.00 to 32.50
Old Car Wheels	24.00 to 25.00
Heavy Melting Steel Scrap	18.50 to 18.75
Mixed Steel	15.50 to 16.00

The following quotations are per net ton:

Iron Fish Plates	.... to $22.00
Iron Car Axles	24.50 to 25.00
Steel Car Axles	23.50 to 24.00
No. 1 Railroad Wrought	20.75 to 21.00
No. 2 Railroad Wrought	18.00 to 18.50
Shafting	20.00 to 21.00
No. 1 Dealers' Forge	16.50 to 17.00
No. 1 Busheling and Wrought Pipe	14.50 to 15.00
Iron Axle Turnings	.... to 15.00
Soft Steel Axle Turnings	14.50 to 15.75
Machine Shop Turnings	.... to 14.00
Cast Borings	10.25 to 10.75
Mixed Borings, &c	10.50 to 11.50
No. 1 Boilers, cut	14.50 to 15.00
Heavy Cast Scrap	17.00 to 17.50
Stove Plate and Light Cast Scrap	13.50 to 14.00
Railroad Malleable	16.25 to 16.75
Agricultural Malleable	16.00 to 16.25

Metals.—The market for Ingot Copper has continued dull and weak, with prices for Lake barely sustained at 11½c. in carload lots and 11¾c. to 12c. in a jobbing way. Pig Lead has sold well, and the market has ruled firm at 4.05c. in 50-ton lots, 4.07½c. in carload lots and 4.10c. in a jobbing way. Sheet Zinc has developed an easier tone, but prices have remained at 6½c. in carload lots and 6.65c. in lots of 600 lbs. Old Metals have been slow and easier, in sympathy with primary markets, and prices have been reduced. The following are the quotations established: Heavy Cut Copper, 10¼c.; Red Brass, 10¼c.; Copper Bottoms, 9¼c.; Lead Pipe, 3.90c.; Zinc, 3.80c.

Coke.—There has been a more ample supply of Foundry Coke, and the market has been somewhat easier, prices ranging from $10 to $11 per ton on track, Chicago. The market has also been a little easier for Furnace and Smelting Coke, contracts for which have been placed at $4 cash, at the ovens, for Connellsville and $3 to $3.25 for Pocohontas for the whole of next year, while for the first half a large tonnage has been placed on the basis of $3.25 to $3.50. Virginia Coke has sold at $4 to $4.25, at ovens, for the first half of 1903. Foundry Coke, however, has been sold at $4.50 to $5 at the ovens for next year's delivery.

Chas. W. Hawley, having withdrawn from Hawley, Jones & Co., Chicago, Laurence A. Jones and Selden R. Hopkins will continue to practice as public accountants and auditors at the address of the old firm under the style of Laurence A. Jones & Co. Chas. W. Hawley also continues to offer his services as accountant or auditor in a special capacity at the same address.

Philadelphia.

FORREST BUILDING, November 25, 1902.

The business situation is not materially different to what it was a week ago, but there is a somewhat more cheerful feeling, due to better prospects in regard to transportation. No great relief is expected immediately, but it is believed that the crisis has been passed, and that gradual improvement may be expected, unless bad weather intervenes. It is not likely, however, that normal conditions will be established until toward spring, but it is some comfort to believe that the worst of the tie up has been seen. Business is done under hard conditions, nevertheless, and the residue of profits is likely to be seriously affected for months to come. Everything costs more than was figured on, and the further back the orders are, and the larger the amount, the worse it is for the seller. Large orders on the books are, therefore, not just as desirable as some people may imagine them to be, the great difficulty is to get rid of them. It may be imagined that advances in wages, congestion of traffic on the railways, and the high prices on raw materials, are indubitable evidences of prosperity, but they have usually proved to be the culminating point of a long period of favorable conditions. If other countries were equally well situated as regards business prosperity, there might be more confidence in maintaining them here, but with a marked decline in Great Britain, and still worse conditions on the Continent, it is absolutely impossible that the United States can continue at the present high range of prices. Europe is sending us Pig Iron, and some finished products at much lower prices than must necessarily be paid for American products, on the present basis of costs. This applies not only to Iron and Steel, but to manufactured articles of every description as well. Moreover, the higher the price of skilled and unskilled labor, the greater probability of an influx from abroad, so that competition will arise not only for commodities, but what is equally effective—labor itself will generate competition. Unless experience is no longer a safe guide, a point has been reached in which the country will find that it is, to a great extent, living on its own fat, and that what are supposed to be evidences of prosperity, are likely to be more or less elusive. High prices are making our country the best place for foreigners to sell in, and the poorest for them to buy in, and at the present rate of going, we shall soon be doing all buying (as regards Iron and its products) and no selling. Surely these are not prosperous conditions, although they doubtless are the result of prosperous conditions in the past, but may contain elements of decadence at some date in the not distant future. The present high prices, however, are the result of unforeseen and unavoidable conditions, but the danger with which they are surrounded ought not to be ignored, but being forewarned is to be forearmed.

Pig Iron.—The scarcity of Iron for this year's delivery is as great, and probably greater, than at any time on record. Those who must have Iron to go on with pay almost anything that is asked for immediate accommodation, and as regards later deliveries there is practically nothing offered. Under present conditions makers see nothing before them but extremely high costs of production, and as they entered large orders during the summer months at prices much below what could be realized to-day they are not inclined to make further engagements until prospects are somewhat clearer. Consumers are similarly embarrassed and for the present are doing as little buying as possible. In most cases there is a great deal of Iron due, and past due, on old contracts, so that there is no great inducement to extend their lines, particularly as there is a reasonable certainty that foreign iron can be had in an emergency at prices not higher than those now ruling, and possibly at a good deal less. Shipments of this class of material have not been coming forward as promptly as was expected, however, and German Iron is now sold subject to delay in case of navigation being interrupted, which in Northern Europe is not unfrequent in winter time. Prospects as regards the supply of Pig Iron are therefore causing renewed anxiety, as a great deal depends on the weather, which in Europe has been exactly the reverse of what it is on this side. There would be less cause for uneasiness if it was merely a question of price, but when there is a possibility of practically no Iron at any price the manufacturing interests have good reason for anxiety. Still, it is well to hope for the best, although there is nothing to be gained by disregarding possibilities of this character. Quotations in times like these cannot be very exact, as every transaction has to be considered on its own merits. Sometimes buyers have to pay more—sometimes a good deal more—but as a rule the following are fair average prices for deliveries in buyers' yards, city or nearby points. Cargo lots of foreign, however, could be done at $1 to $2 less, c.i.f., duty paid:

No. 1 X Foundry	$25.00 to $26.00
No. 2 X Foundry	23.50 to 24.50
No. 2 Plain	22.75 to 23.25
Gray Forge	21.00 to 21.50
Middlesbrough	21.50 to 22.00
Scotch	23.00 to 24.50

Billets.—Foreign Steel is offered at about $27 for ordinary Steel in lots of 500 to 1000 tons, but on cargo lots $26 to $26.50 could be done, perhaps a little less, as there is a good deal of Steel offering. American Steel is scarce, and $30 is probably as well as could be done, but the run is mostly on special Steel, with prices accordingly.

Plates.—The scarcity of fuel is unbroken, and the mills have been making poor outputs, so that orders have piled up considerably, and mills are further than ever behind with their orders. Prospects for fuel are a little better, but there is not much chance of manufacturers being in a position to keep up with their orders for a long time to come. There is a heavy demand for Plates, but the mills are handicapped to such an extent that it is impossible to work economically, so that it should be no surprise to see higher prices, but in the meanwhile last week's figures are still in force as follows: Small lots, 2.10c. to 2.15c.; carload lots, ¼-inch and thicker, 2c. to 2.05c.; Universals, 2c. to 2.05c.: Flange, 2.10c. to 2.20c.; Fire Box, 2.25c. to 2.30c.: Marine, 2.30c. to 2.35c.;

Charcoal Plates, C. H. No. 1, 2½c.; C. H. No. 1 Flange, 3c.; C. H. No. 1 Flange Fire Box, 3½c.

Structural Material.—There is a good demand for Structural Shapes, and anything that can be shipped promptly brings good prices, say 1.90c. to 2.25c., according to what may be wanted. For deliveries after the first of the year, $2 or $3 per ton better can be done, and for a large order covering the first six months of the coming year orders could be placed at from 1.75c. to 1.90c. There is not much margin for foreign material unless it happens to be on the spot, but it is reported that a lot of new business has been placed with German and Belgian mills for shipment at an early date.

Bars.—At the last monthly meeting of the Bar Iron Association it was decided to make 1.80c., Pittsburgh, the minimum price for Refined Iron in carload lots and upward. There is a good demand and prompt deliveries are hard to get, but with better supplies of fuel and better transportation facilities an increased production may be looked for, so that there is no probability of any greater stringency in supplies than there is at the present time. Steel Bars are also low in comparison, so that orders for Refined Bars are not very pressing, and large buyers will probably wait to see what the holidays will bring forth before doing much business. Refined Bars, however, are quoted at 1.92½c. to 1.95c. and Steel, 1.75c. to 2c., according to dates for shipment.

Sheets.—There is a fairly good demand, and for early deliveries mills have plenty of work. There is also some inquiry for large lots for next year, but as yet it has not resulted in important transactions. Prices are steady, varying, however, according to quantity, date for delivery and other considerations, such as quality, specifications, &c.

Old Material.—Business is unsatisfactory. Those who want to buy regard prices as too high. Those who want to sell see little or no margin at the prices which buyers are willing to give, so that a good deal depends on which side is under pressure to trade. Bids and offers are about as follows for lots delivered in buyer's yards:

Old Steel Rails	$21.00 to $21.50
Heavy Steel Scrap	20.50 to 21.00
Low Phosphorus Scrap	26.50 to 27.50
Old Steel Axles	25.00 to 26.00
Old Iron Rails	24.00 to 25.00
Old Iron Axles	29.00 to 30.00
Old Car Wheels	20.00 to 21.00
Choice Scrap, R. R. No. 1 Wrought	22.00 to 23.00
Country Scrap	20.00 to 21.00
Machinery Cast	19.50 to 20.00
No. 2 Light Scrap	17.00 to 18.00
No. 2 Light (Ordinary)	14.50 to 15.00
Wrought Turnings	16.00 to 16.50
Wrought Turnings, Choice Heavy	17.00 to 17.50
Cast Borings	10.00 to 10.50
Stove Plate	14.00 to 15.00

Cleveland.

CLEVELAND, OHIO, November 25, 1902.

Iron Ore.—Weather conditions will now determine the amount of Ore that is yet to be brought down the lakes this year. Already the amount brought down the lakes is ample for all possible needs during the winter. With the end in view, however, of enlarging the surplus as much as possible to provide for any contingency which may arise in the spring to delay the shipment of a new supply, the movement will continue this year as long as it is possible without increased cost. The boats of the Steel Corporation fleet and others will therefore be kept running as long as the weather will permit, which seems now to be limited to the present week or shortly past that time at the best. The rates of carriage have remained unchanged, as follows: 80c. from Duluth, 70c. from Marquette and Escanaba. Nothing is being done in ore sales for this year's delivery and the prices for next year are not even being discussed.

Pig Iron.—The Pig Iron situation this week might be said to be the strongest feature of the entire industry. While in some respects other conditions are slightly unsettled, the Pig Iron market has shown a steady and strong tendency upward, with a buoyant demand for all grades and with orders coming in and inquiries appearing in a way that is encouraging. It is true that in some respects the market is easier, and especially when brought into comparison with those conditions which existed during October and during the first two weeks of the present month. The demand, however, is fully equal to the supply and more during the first half of next year, and there is now also a demand for all of the material that can be produced through the third quarter of next year, for which period sales are already being made. The only thing that is a present and an urgent question is the supply of Coke. The situation in the Valleys seems to have been relieved during the past week to a certain extent, but not so generally as seems necessary if there is any permanent relief to be experienced. Most of the stacks which had banked their fires a week ago are still in idleness, and it seems evident now that they must continue so for some time. The almost complete revolution in the railroad situation and the relief from the congestion have emphasized the fact that it is not the railroads which are altogether to blame for the present distress at the furnaces, a part of the blame falling justly upon the coking ovens. The two sides to this question add interest and seriousness to the possibility of a Coke shortage lasting throughout the winter. What has been said before about the extension of the Pig Iron shortage into the first half of next year with equal or greater force than it has had this year, is being emphasized with the developments of the present time. It has gone so far that the understanding is that some of the foundries here have made inquiries abroad for a further supply of Iron for the first half of next year, which statement inclines to offset some of the gossip which has been going about a failing market. Prices on Foundry Iron have not changed much for the first half delivery next year or for spot shipment. The price for immediate delivery, where any material is to be had, hangs about $27 to $28 at the furnace, with, however, a very limited number of transactions at that or any other price. The first big selling of Foundry for delivery during the third quarter of next year has already been made, and the price ranges well enough up to satisfy those who are looking for and desiring a strong market. No. 2 Foundry is being quoted at about $21.50 to $22 at the furnace. The demand for Basic and Bessemer Iron is no less than it has been all along, but there are evidences now that the furnaces are not anxious to make any sales. The uncertainty when the present contracts will be fulfilled is enough to cause the furnaces to be just a little slow in taking in big orders, especially as they do not yet know to an absolute certainty the price of Coke. It seems, however, that when the association fixes its new basis of prices there will be certain increases which have not hitherto been expected. Bessemer is now quoted at $23 for first half delivery, and Basic at $21.

Finished Iron and Steel.—When the state of the Pig Iron market is taken into consideration some things which appear in the Steel trade are not easily understood or explained. The only basis upon which the apparent decline of demand for Steel and the more or less general lack of specification can be harmonized with the growing demand for Pig Iron is that most of the consumers are getting ready now for invoice time and are clearing up their stocks against such an occasion. Plates have been selling fairly strong for several months and it has seemed possible that the mills would not be able to supply the demands of the consumers. The latter, however, are slow in specifying on old contracts and it is difficult for the mills to obtain them. The only immediate effect is on the deliveries that are promised. In some instances six months' or even four months' delivery has been offered where eight and nine months was the best promised before. The larger mills hold assiduously to the old price of 1.60c., Pittsburgh. The smaller mills are finding that they have about come to the end of their string on material bringing large premiums, especially on Heavy Plates. It is now easier to get them than heretofore, while there is a great demand for ¼ and 3-16 inch Plates, with the supply limited and the price way up. Jobbers are also feeling the lessened demand for their heavier Plates. The smaller mills are shading 2c. on Heavy Plates at the mill, while the jobbers are weak on 2.25c. out of stock for Sheared Plates and 2.50c. for Universal Mill. Sheets are also on the decline and there has been further talk of a reduction in the price, and this no doubt has kept a good deal of business back. The mills, however, show no disposition to grant any lower price and in the meantime prices remain as they have been, 3.10c. to 3.25c. for No. 27 out of stock and 2.85c. to 2.95c. at the mill for carload lots of the same gauge. Galvanized Sheets are bringing 3.70c. to 3.85c. for No. 27. The state of the market is more clearly shown in the conditions surrounding Structural Steel. This material has not been sold so far in the future as Plates and the mills are more susceptible to the immediate conditions of the market. The difficulties in obtaining specifications on old orders have been great during the past week and it is said that some of the mills in the East which have been holding for 2.50c. have dropped to 2c. Jobbers, however, are still having an active demand, for which they get from 2.50c. to 3c. The standard mills are still willing to take business at 1.60c., Pittsburgh. Bessemer Billets are trending downward steadily, but there has been no serious break so far. A basis of $28 is suggested for Billets, but the mills prefer to use their own material than to sell it at such a price. The prices at which Billets have been quoted during the past few weeks have been $31 for Open Hearth and $30 for Bessemer. Bars have continued to be the weak sister of the whole market. It is now said with authority and emphasis that the price of Bar Iron has gone off and that 1.70c., Pittsburgh, is the best that has been paid for the last two weeks. On the whole the market is in such a state that both the consumers and the mills are looking with considerable interest to the opening of the new year, when more settled conditions are generally expected.

Old Material.—The Scrap market has been very quiet, with no sales of importance. The necessity to reduce Bar Iron prices has further necessitated a reduction in the price of Mill Scrap, but the dealers have not yielded to what appears to be the general demand. The prices remain as they were, with the understanding, however, that if any sales are

made soon they ought to be on a lower list of prices. Nominally, however, the prices are as follows: No. 1 Wrought, $21, net; Iron Rails, $27.50, gross; Iron Axles, $28, net; Cast Borings, $12, gross; Wrought Turnings, $16.50, gross; Cast Scrap, $19, net; Car Wheels, $19, gross; Heavy Melting Steel, $19, gross; Old Steel Rails, $19, gross.

Birmingham.

BIRMINGHAM, ALA., November 24, 1902.

The Iron market is frisky and coquettish. It is a rare thing to get the same quotation for one grade from different sources. The circumstances surrounding some are different from those surrounding others, and they tincture quotations. Basing quotations on actual sales is what is aimed at, but that is not in all cases reliable, because they represent small sales. These are given out for publication, the prices being at top, while sales of quantities that test the wholesale value of Iron are withheld. There has been a material difference of late between quotations from here and those given by buying markets in almost hourly communication with this market. The assertion is again made that quotations as given in these letters are based on actual transactions, and the information concerning them comes from primal sources.

Some interests say that there is a little easing up in the price, while it is stated by others that there is practically no change. Some No. 2 Foundry was sold in a limited way at $24; and, in small lots, at $25, when everything conspired to speed the shipment. From these figures you can hear of lower values down to $19.50, but you cannot find the seller who will admit the sale. Spot and nearby Iron are in too limited supply to believe that the minimum price was accepted. Indeed it is most emphatically denied. No. 2 Foundry for the first half of 1903 was sold at $21, and some sold at $20 delivery up to October. No. 3 Foundry sold for the first half of 1903 at $20. No. 4 Foundry is quoted at $20 for the first half of 1903. Gray Forge runs the gamut from $17.50 to $19 and Mottled hangs around $18. In some cases higher prices have been obtained. A conservative view of conditions prompts the statement that the market is on the basis of $22.50 to $23 for November and December and $20 to $21 for the first half of next year. For the last half of next year sales were made at $20, one lot being 500 tons. There were a few more sales at that price and there were sales at less, the figures being withheld. Some of the furnace interests are not in the market for any delivery, and some that are are averse to making their prices public.

It is gradually leaking out that some large interests which have been holding out of the market will be forced to come in in January *nolens volens*, and take on a good load. One interest is mentioned whose requirements for first half of 1903 are 200,000 tons, against which they have bought so far but 25,000 tons. Others mentioned, though not in so bad a fix, are in the trough of the sea and wishing they could see land once more. The car famine mentioned last week is not only no better, but it is worse. As an instance of its acuteness here, a car of Iron was shipped from a furnace here to a local customer in the city. The distance between them was probably 5 miles. The date of shipment was October 5. The buyer the past week was trying to locate that car. If right at our door such things can be, what must be the fate of many long distance shipments?

The placing of "empties," in response to applications for Iron shipments, is very tardy. One interest the past week asked for 40 cars and got four. Another wanted 20 and got two cars. Thus it goes all along the line. Mention is made of these circumstances that buyers may be informed of the insurmountable difficulties that beset the shippers at present. There is no relief until the prevailing jam is relieved. The railroads are bending all their energies now to that end. But there is no relief in sight yet. As a result of present conditions, Iron is being piled up in the yards awaiting cars in response to applications repeatedly made. One interest had 5000 tons on the 1st inst., awaiting cars. Since then the amount has been increased to 8000 tons, and it is being added to every day. Others are in the same fix. At some of our most important Coal mines the output varies from one-third to three-fifths of the amount under normal conditions, and there is nothing to do but wait for the promised relief.

Furnace practice and furnace output show a material improvement for which we are partly indebted to the fine weather that has been our fortune. In Coke there have been easier prices, but they are yet stiff enough to materially affect the cost of Iron. It is quoted at $6 to $6.50, with some sales made at $6.25. In Coal the situation is strong, but there is almost an embargo on shipments, and operators are losing both time and money by the car famine.

There has been practically concluded the past week an important land deal in Walker and Winston counties, just north of us, which involves about 30,000 acres of land. The purchasers are Western people who will develop the property by erecting saw mills and engaging in other enterprises. It only remains to deliver an acceptable deed to make it a *fait accompli*. The report of the Southern Iron Committee shows that shipments from the Southern field for the first nine months of this year are in round numbers about 200,000 tons in excess of the same period last year.

The action of the Southern Railway Company in purchasing necessary real estate here for the erection of large shops for construction and repair purposes is significant of the favor in which this locality is held by the railway interests. The purchase extends from North Birmingham to Thomas, nearly 1 mile; and in width, 800 to 900 feet. Plans for large buildings are in hand and their dimensions indicate that this point will be of special importance in that line; and it is more than probable that this will be a point of concentration in the department of construction and repairs. Efforts have failed to obtain reliable information as to intentions of the Car & Foundry Company, but the only officials who can satisfy a craving thirst for information are in New York to attend a meeting of the directors this week, when it is supposed their policy will be declared. It is openly stated now that the L. & N. R. R. has given orders to make the road from here to Calera a double track. This example is followed by the other roads, whose present facilities for handling their business are insufficient.

St. Louis.

CHEMICAL BUILDING, November 26, 1902.—(*By Telegraph.*)

Pig Iron.—Business in the Pig Iron market is reported on about the same basis as in our previous week's report. While some business has been executed for the first half delivery, it is not in any considerable volume. Considerable spot Iron continues to come to this market and there does not exist such a wide range in the price for it as compared to Iron for far off delivery. Uncertainty in the delivery of contract Iron, as well as Coke, owing to the inadequate facilities of the railroads, is still a serious hindrance to consumers. We quote, f.o.b. St. Louis:

Southern, No. 1 Foundry	$24.75	to	$26.75
Southern, No. 2 Foundry	23.75	to	25.75
Southern, No. 3 Foundry	23.25	to	25.25
Southern, No. 4 Foundry	22.75	to	24.75
No. 1 Soft	24.75	to	26.75
No. 2 Soft	23.75	to	25.75
Gray Forge	22.75	to	24.75
Southern Car Wheel Iron	....	to	....
Malleable Bessemer	....	to	....
Ohio Silvery, 8 per cent. Silicon	....	to	....
Ohio Strong Softeners, No. 1	....	to	....
Ohio Strong Softeners, No. 2	....	to	....

Bars.—Jobbers continue to refer to the demand for Iron and Steel Bars as being of moderate extent. It is remarked the general conditions as they exist among the manufacturers, the matter of price considered, perhaps hinder any special broadening tendency of trade which might be felt at this time. We quote from the mills Iron Bars at 1.85c. to 1.95c. and Steel Bars at 1.80c. to 1.90c. Jobbers quote Iron Bars at 2.25c. and Steel Bars at 2.25c.

Rails and Track Supplies.—Large new requirements continue to show with regularity in this department of the market and the business now being booked is mostly for delivery the last half of the new year. We quote as follows: Splice Bars, 2.10c.; Bolts, with Hexagon Nuts, 3.25c. to 3.30c.; with Square Nuts, 3c. to 3.10c.; Spikes, 2.60c. to 2.75c.

Angles and Channels.—The movement of small Angles and Channels among the jobbers is said to be in very fair volume. For materials of this class 2.50c., base, is asked.

Pig Lead.—The Lead situation remains as last reported and the volume of demand and inquiry continues light. We quote Chemical at 3.97½c. and Desilverized at 4c.

Spelter.—Urgency to unload has been noticeable in the Spelter market the past week and prices show considerable decline. Quotation of 4.87½c. to 4.90c. is quite general at this time.

The F. A. Goodrich Iron & Steel Company, the St. Louis representatives of the Jones & Laughlin Steel Company, have closed a contract for the entire construction of the Steel skeleton building for the Carleton Dry Goods Company in St. Louis.

Cincinnati.

FIFTH AND MAIN STS., November 26, 1902.—(*By Telegraph.*)

The situation in Pig Iron is rather hard to define. Iron is certainly settling somewhat in price, and while the general market is theoretically a strong one, yet there is a very marked element of uncertainty as to what extent the decline will go. No one believes in the possibility of a slump, but still a drop of $5 per ton is already in sight on spot Iron. Twenty-five dollars, Birmingham, for No. 2 Foundry was probably very close to the high water mark for spot delivery Iron. This same Iron is now to be had at $22, with an inkling of even $1 lower in some quarters. For the first half of next year the scale varies from $20 maximum

down to $19, with a promise of $18 in the near future. The minimum basis for the last half of next year is still $18, Birmingham, for the same grade. Inasmuch as there is no longer a pinch for prompt delivery stock, it is held that the return to the recent high basis is not to be thought of as likely to come soon. The present demand for Iron of any delivery is rather light, and in the main confined to lots of 100 tons and less. For nearby deliveries the low grade irons are still weak and out of proportion to the list. Freight rate from the Hanging Rock district $1.10, and from Birmingham to Ohio River points $3.25. We quote, f.o.b. Cincinnati, for 1902 delivery, as follows:

Southern Coke, No. 1	$24.25 to $26.00
Southern Coke, No. 2	23.25 to 25.00
Southern Coke, No. 3	22.25 to 24.00
Southern Coke, No. 4	19.00 to 20.00
Southern Coke, No. 1 Soft	24.25 to 26.00
Southern Coke, No. 2 Soft	23.25 to 25.00
Southern Coke, Gray Forge	19.00 to 20.00
Southern Coke, Mottled	19.00 to 20.00
Ohio Silvery, No. 1	30.10 to 32.10
Lake Superior Coke, No. 1	26.60 to 27.10
Lake Superior Coke, No. 2	26.10 to 26.60
Lake Superior Coke, No. 3	25.60 to 26.10

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	$28.25 to $29.25
Lake Superior Car Wheel and Malleable	27.50 to 28.50

Quotations for 1903 shipment, freight rates only guaranteed to March 1, are as follows, f.o.b. Cincinnati:

Southern Coke, No. 1	$22.75 to $24.00
Southern Coke, No. 2	22.25 to 23.25
Southern Coke, No. 3	21.75 to 22.75
Southern Coke, No. 4	20.00 to 21.00
Southern Coke, Gray Forge	20.00 to 21.00
Southern Coke, Mottled	20.00 to 21.00
Southern Coke, No. 1 Soft	22.75 to 24.00
Southern Coke, No. 2 Soft	22.25 to 23.25
Lake Superior Coke, No. 1	26.60 to 27.10
Lake Superior Coke, No. 2	25.60 to 26.10

Plates and Bars.—The situation is neither very strong nor very active, yet quotations are nominally unchanged. Iron Bars in carload lots, 1.92c., with half extras; same, small lots, 2.20c., full extras; Steel Bars, carload lots, 1.72c., with half extras; same, small lots, 2.20c., full extras. Plates are quoted nominally, ¼-inch, in carloads, 1.70c.; same, 3-16, 1.80c. As a matter of fact, however, mills having Plates to ship are getting 2.15c. without trouble. I-Beams and Channels, 1.70c., base. All prices f.o.b. Cincinnati.

Pittsburgh.

(By Telegraph.)

PARK BUILDING, November 26, 1902.

Pig Iron.—The tremendous freight movement of last Saturday and Sunday by the railroads in the Pittsburgh district has been felt, and reports from the Valleys are that shipments of Coke give promise of soon being better. For three days last week practically no Coke was received by the Valley furnaces, and quite a number of stacks were down. The same is true of the Chicago and Wheeling districts, both of these places being short of Coke and furnaces being compelled to bank. The Coke situation will hardly show much relief during the winter months, but in the early spring it will probably right itself, and then the furnaces will get Coke enough to allow them to make their full quota of Iron. There is not much doing in Pig Iron, and the situation will likely be quiet until after the first of the year. Bessemer Iron in large lots for shipment over first six months could be bought at $21 to $21.50, at Valley furnace. Small lots of prompt Iron bring $23 to $23.50, at furnace. Gray Forge is about $20.75, Pittsburgh, and we note a sale of 500 tons at that price. There is not much inquiry for Foundry Iron, as consumers are covered for months ahead. No. 2 Iron for prompt delivery brings $24 to $25, Pittsburgh, while for first six months about $22, at furnace, or $22.75, Pittsburgh, is quoted.

Steel.—The Steel market is quiet, but prices are strong. Foreign Billets are quoted at $29 to $29.50, Pittsburgh, but these prices fail to bring business. Domestic Bessemer Billets are quoted all the way from $28.50 up to $30, at mill. It is said that a leading local Steel producer is offering 30,000 tons of Bessemer Billets for December and January shipment at $30, Pittsburgh. Higher prices are being quoted on Open Hearth Steel, for which there is a good demand. We quote Open Hearth Billets, ordinary Carbons, at $32 to $33, Pittsburgh.

Freight Rates.—A material advance in freight rates on all kinds of Iron and Steel is almost certain to be made by the railroads, effective January 1. The rate on Pig Iron from the Valleys to Pittsburgh, which is now 75c., will be increased to 85c. or 90c. The present rate on Billets from Youngstown and Wheeling to Pittsburgh is 85c., but this will likely be increased to $1. On Finished Iron and Steel material advances in freights are to be made. As a reason for the higher rates the railroads point out the fact that wages have been advanced 10 per cent. and that railroad equipment of nearly all kinds, such as engines and cars, has increased in cost from 25 to 50 per cent. in the past year or two.

(By Mail.)

Conditions in the Iron trade are somewhat mixed, some reports being quite bullish while others are pessimistic. The trade does not seem to have gotten over the reductions in prices made on Sheets, Tin Plate, Pipe and Wire products, and there is a disposition on the part of buyers to hold off placing orders, but this is not unusual at this season of the year; but, in fact, is customary. Those who take a conservative view of the situation insist that the Iron trade is in a healthy condition and that there is no cause for alarm as to the future. The fact is pointed out that the furnaces have a heavy tonnage of Pig Iron on their books, the Rail mills are filled up for first eight months of 1903; tonnage in Plates and Structural Steel is very heavy, orders already booked for these taking output of the mills for first four or six months, while the railroads were never as heavy buyers as they are at the present time. It is further pointed out that the reductions made in prices were not due altogether to lack of demand, but simply to changed conditions, caused by the entrance into the market of so much new capacity. Buyers who go out into the market to place contracts for material do not find any demoralization in prices, but on the contrary the market is firm. There is not likely to be much improvement in the situation until after the first of the year, nor on the contrary is there likely to be any decided decline in prices. The situation indicates that there will be another year at least of prosperity in the Iron trade, but along toward spring prices on Pig Iron may possibly go off $2 or $3 a ton, as by that time the railroads will be in better shape, and will be giving the furnaces better deliveries of Coke. The Pig Iron market continues exceedingly strong, but there is not much tonnage being placed, buyers being pretty well covered. Bessemer Iron for first half is $21 to $21.50 at furnace, and for prompt delivery is $23 to $23.50 at furnace, but spot sales have been made at slightly higher prices. Bessemer Steel is $29 to $29.50, Pittsburgh, but there is very little doing. There is no special change to note in Finished Material. The consolidation of the Sharon-Union Steel Company is the principal topic of interest here this week, and the general opinion is that the consolidation will be very beneficial to both concerns. Economies in manufacture and management will be effected, allowing the concern to make material at a lower cost. A good many details of the consolidation yet remain to be arranged. Gossip here has it that the new Union Steel Company will eventually be absorbed by the United States Steel Corporation, but this is not confirmed and is probably untrue. It is also said that about three months ago a deal was on for the purchase of the Sharon Steel Company by the United States Steel Corporation, but as the figure asked for the property was too high nothing came of it. The railroad situation is somewhat better, and an enormous number of cars, said to have been over 40,000, were moved last Saturday and Sunday in the Pittsburgh district alone. Thursday (Thanksgiving Day) will be a holiday in general business, but will be taken advantage of by the railroads to get as much freight moved as possible.

Muck Bar.—The market is quiet, and prices are weak and lower. We quote local makes of Muck Bar at $33.50, Pittsburgh, the lowest price reached in this market for a long time.

Spelter.—The market is somewhat lower, demand being dull. We quote Prime Western at 5.18½c. to 5.20½c., Pittsburgh. It is thought prices will improve before long.

Plates.—Large consumers of Plates advise us that prompt deliveries are as hard to get as at any time in the last three or four months, and prompt Plates continue to bring from 1.85c. to 2c., Pittsburgh, depending on the order and how soon the material is wanted. A very heavy tonnage is in sight, and the Plate mills will be crowded with work for months to come. Official prices for extended delivery are as follows: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

Ferromanganese.—English Ferro is $50 for large lots and $51.50 to $52.50 for small lots, delivered anywhere in the United States. We note a sale of 100 tons at $50 for Western delivery.

Sheets.—Reports on the Sheet market are somewhat conflicting, some mills reporting a slightly better demand, while others say that the market is still in very unsatisfactory shape. Prices on Galvanized Sheets are being cut a good deal, and to many mills are below cost of production. It is said that some mills are quoting prices for Black and Galvanized below those of the leading interest. We quote Nos. 22 and 24 Black Sheets, box annealed, one pass through cold rolls, at 2.45c.; No. 26, 2.55c.; No. 27, 2.65c.,

and No. 28, 2.75c. For small lots the usual advances are charged. We quote No. 26 Galvanized Sheets at 3.35c., or 75 and 10 off; No. 27, 3.60c., or 75 and 10 off, and No. 28, 3.85c., or 75 and 10 off. All the above prices are f.o.b. at mill.

Steel Rails.—Probably 50,000 tons have been placed in the past week or two for delivery late next year. The mills are said to be filled up to next September. We quote at $28 at mill for Standard Sections.

Structural Material.—No large contracts have been placed here recently, but a good deal of work is in sight. Deliveries on Angles can now be had promptly, and prices are a little lower than on Beams and Channels, for which 2c. to 2.50c. for prompt delivery is still being paid for small lots. Official prices for indefinite delivery are as follows: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c. to 1.85c.

Rods.—The market is quiet, and we quote Bessemer Rods at $35.50, Pittsburgh. On a firm offer this would likely be shaded.

Bars.—A moderate tonnage is being placed in Steel Bars, but specifications on old contracts are not coming forward very freely, and if this continues some of the mills may be short of work before the first of the year. In Iron Bars a moderate tonnage is being placed, but new business is not nearly so large as the output of the mills, and they are catching up very fast on contracts. Buyers are being urged to send in specifications. We quote Iron Bars at 1.70c. in carloads and 1.75c. to 1.80c. in small lots, f.o.b. Pittsburgh, half extras, as per National card. We quote Steel Bars at 1.60c., at mill. All specifications for less than 2000 lbs. of a size subject to the following differential extras: Quantities less than 2000 lbs., but not less than 1000 lbs., 0.10 per lb. extra. Quantities less than 1000 lbs., 0.30 per lb. extra, the total weight of a size to determine the extra regardless of length.

Merchant Steel.—New tonnage being placed is light, and the mills are better caught up on contracts than for some time. Prices are fairly firm, but on Crucible Steel concessions are being made. We quote: Tire, 2.15c. to 2.25c.; Spring, 2.25c. to 2.35c.; Toe Calk, 2.30c. to 2.40c., base; Sleigh Shoe, 2.15c. to 2.25c. Differentials are as follows: Less than 2000 lbs. of a size and not less than 1000 lbs., 10c. advance; less than 1000 lbs. of a size, 30c. advance; Cold Rolled Shafting is 47 per cent. off in carloads and 42 per cent. in less than carloads delivered in territory east of the Mississippi and north of the Ohio rivers. Tool Steel is 6½c. to 10c. for ordinary grades and 12c. and upward for special grades.

Skelp.—The market is very dull and there is considerable pressure on the part of the mills to sell. We quote Grooved Iron at 1.92½c. to 1.95c. and Sheared at 2.05c., Pittsburgh.

Merchant Pipe.—A moderate amount of new tonnage is being placed and the leading interest report that their business this year is very much larger than for last year. The independent mills are taking a good deal of tonnage and the tone of the market is fairly strong. The leading outside Pipe mills, such as Youngstown Iron Sheet & Tube Company, La Belle Iron Works, Eastern Tube Company and others, are now quoting the same discounts as the leading interest. Pittsburgh basing discounts, as adopted November 12, are as follows:

(Subject to no preferential discounts.)

	Merchant Pipe, Steel or Iron, at our option to be shipped.		Merchant Pipe guaranteed Wrought Iron.		Full weight Steel Pipe.		Full weight guaranteed Wrought Iron.	
	Blk.	Galv.	Blk.	Galv.	Blk.	Galv.	Blk.	Galv.
⅛, ¼ and ⅜	68	58	65	55	67	57	64	54
½	70	60	67	57	69	59	66	56
¾ to 6	75	65	72	62	74	64	71	61
7 to 12	73	63	70	60	72	62	69	59
Plugged and Reamed:								
1 to 4	73	63	70	60	72	62	69	59
Cut 3 to 6 feet:								
⅛, ¼ and ⅜	63	52	60	49	62	51	59	48
½	65	54	62	51	64	53	61	50
¾ to 6	71	60	68	57	70	59	67	56
7 to 12	69	57	65	54	68	56	64	53
Cut to 6 ft. and longer:								
⅛, ¼ and ⅜	64	53	61	50	63	52	60	49
½	66	55	63	52	65	54	62	51
¾ to 6	72	61	69	58	71	60	68	57
7 to 12	70	58	66	55	69	57	65	54
Extra Strong, Plain Ends:								
⅛ to 8	69	59	65	55	68	58	64	54
Threads only	Same as Plain Ends, plus 1¼ per cent., net.							
Threads and Coupl'gs.	Same as Plain Ends, plus 3 per cent., net.							
Double Extra Strong:								
½ to 8	61	51	57	47	60	50	56	46
Threads only	Same as Plain Ends, plus 2 per cent., net.							
Threads and Couplings.	Same as Plain Ends, plus 3 per cent., net.							

NOTE.—Orders for less than carloads will be charged at 12½ per cent. advance. Extra and Double Extra Strong cut lengths, lower random discounts by 10 per cent. net for 6 feet and longer, and 15 per cent. net for 3 to 6 feet.

Boiler Tubes.—The demand is pretty well over for this year, but the mills have considerable work ahead. Discounts are as follows:

Iron Boiler Tubes.

1 to 1½ inches and 6 to 13 inches	36½ %
2¾ to 5 inches	45½ %
1¾ to 2½ inches	35½ %

Coke.—Connellsville Furnace Coke for shipment over balance of this year and into January is being sold right along at $5.50 to $6 a ton. Contracts for Furnace Coke for first six months have been made at $4 a ton and Foundry at $4.50 to $5 a ton. Output of Coke last week fell off very much because the railroads did not furnish motive power and cars. The Frick Coke Company were compelled to shut down ten plants nearly the whole week. Output was less than 280,000 tons, and will probably be less this week, as the motive power and car situation is said to be worse than ever.

Iron and Steel Scrap.—The Scrap market is almost at a standstill, consumers declining to take in material until after the first of the year. Prices are only fairly strong and there is a good deal of pressure on the part of brokers to sell. We quote Heavy Melting Stock at $21 in gross tons; No. 1 Cast Scrap, $19; No. 1 Wrought Iron Scrap, $20.50 in net tons; Cast Iron Borings, $11.50 in gross tons; Old Iron Rails, $25 to $25.50 in gross tons.

The Electric Controller & Supply Company, Cleveland, Ohio, opened a Pittsburgh office, 401 People's Savings Bank Building, last week, with John S. McKee in charge. Mr. McKee was formerly with the National Steel Company, Sharon, Pa., as electrician in charge.

The New York Machinery Market.

NEW YORK, November 26, 1902.

There is little change in the general situation. Whatever change there is has tended toward improvement rather than otherwise. In certain lines an increase of demand is reported, much to the surprise of the trade. When business began to fall off several weeks ago the opinion of machinery merchants was that an early pre-holiday lull had set in and that no improvement could be expected before the first of next year. Contrary to this view there has been an increase of orders. What is much more important, however, is that the inquiry has shown marked betterment during the last few days and consequently the tone of the market is much firmer. There is little apprehension expressed in the trade now over next year. Everywhere the predictions for early 1903 are optimistic. Builders of machine tools and manufacturers of boilers, engines and power plant appliances are a unit in stating that there is enough business in sight to insure a good beginning for the new year. Prices are being well maintained in most lines.

Further purchases of machine tools have just been made by the General Electric Company. The Niles-Bement-Pond Company have just received an order for boring and turning mills, of their standard design, which is probably one of the largest orders ever placed at one time for machines of this character, amounting, as it does, to about $140,000. The machines range in size from 6 to 25 feet swing. It is understood that these machines are to be used in the new works, at Schenectady, devoted to the manufacture of steam turbines of the Curtis type. Bids are in on considerable additional equipment, but the official awards have not been sent out as yet.

In connection with the proposed steel car plant, of which we made mention last week, we understand that developments are progressing favorably. We are informed that it is now intended to build the plant about five times as large as was originally planned. Henry S. Fleming of 1 Broadway, who sent out the original specifications for machinery equipment, stated to a representative of *The Iron Age* that the matter was being held up temporarily owing to a change in plans, but would not give information as to the proposed scope or details of the work. That Cornelius Vanderbilt is interested in the project is now thoroughly believed in the trade, as it is stated that one of his representatives is now concerned in the proposed purchases. A prominent Liberty street machinery house have made their proposition to this gentleman direct.

No announcement has been made as yet by Richard L. Newman of 17 State street in reference to the shipbuilding project which he has under way. As stated in these columns last week, Mr. Newman has sent out a good sized list of specifications for shipbuilding tools. It is rumored in the trade that he is acting in behalf of the Norfolk & Hampton Roads Shipbuilding & Dry Dock Company, a new concern, who are to build an extensive plant in the South. This has not, however, been substantiated and may simply be a surmise.

The American Tube Works of Boston have decided to move their plant to Quincy, Mass., and are now preparing plans for the new works and specifications for the additional equipment which they will require. The company have just purchased about 50 acres of land adjoining the plant of the

Fore River Ship & Engine Company. On this tract the tube company will build a plant for the accommodation of from 1200 to 1600 workmen, and will ultimately move their present Somerville plant to this point. The land has a frontage of ¾ mile on Fore River and Hayward's Creek, and this was one of the principal attractions of the site, since it will give the company excellent transportation facilities.

The report that the Chicago Pneumatic Tool Company will erect plants in Scotland and Germany is generally accredited in the trade. Parties who are in a position to know of the movements of the company confirm the report, but it is impossible to obtain official confirmation, as Mr. Duntley, the president of the company, is now in Europe, and will not return until early next month.

The B. F. Sturtevant Company are also actively engaged in preparations for the establishment of a plant in Europe.

The Southern Railway are purchasing a considerable quantity of machinery for the equipment of a new system of car and repair shops, to be erected in the South. S. Higgins, mechanical superintendent, whose offices are at Washington, D. C., is in charge of the work.

Fitchburg Machine Works, Fitchburg, Mass., now under the management of F. B. Manville, advise us that they have changed and brought up to date their entire line of lathes, horizontal boring mills and traverse head shapers, and have discontinued the manufacture of planers and drill presses. The executive staff of the establishment and much of the working force have been reorganized, and it is stated that the company now have orders ahead sufficient to keep the plant busy for some months.

The Ezekiel & Bernheim Company, auctioneers, of 334 Main street, Cincinnati, Ohio, are closing out the surplus of steel and iron working machinery and tools of the Steel & Iron Safe Company's plant to-day. The machinery to be disposed of consists of a general assortment of lathes; engine, column, plain, speed, hand spinning, fox, turning, screw cutting pulley, wood, &c., drill presses; column, radial, spindle, post, plain suspension, stove makers', horizontal, &c.; engines; upright and horizontal; cutting off machines, crank shapers, milling machines, gear cutters, power and foot power hammers, power and hand punches and shears, heavy bulldozer, hand and power punches and shears, power and hand rolls, metal folders and angle benders, emery wheel stands and grinders, pipe machines, bolt cutters, rivet cutting machines, screw cutting machines, polishing wheels, slab grinders, grindstone frames, metal circular saw, anvils, blacksmith vises, blacksmith power and hand forges, furnaces, pressure blowers and exhaust fans, steam pumps, valves, steam heaters, plating dynamos, gas machines, tackle blocks, belting, shafting, hangers, pulleys, &c.

The Commonwealth Electric Company of Chicago, who are installing a General Electric turbine generator, have placed an order for two additional General Electric turbines. The plant is laid out for eight of the machines.

A. A. Gery of the Montello Brick Company, 522 Washington street, Reading, Pa., advises us that they are in the market for 1000 horse-power of boilers, two 400 horse-power engines, shafting, belting, blowers, steam shovels, rails and dump cars, for the new plant they are to erect in that city. It will be of brick, two and three stories, the buildings being 80 x 100 feet, 80 x 120 feet and 118 x 120 feet respectively. The outlay will approximate $400,000.

The Nairn Linoleum Company of Kearney, N. J., are extending their plant. They recently erected a new power house, but the full equipment has not been installed as yet. The machinery to be used in the manufacturing process is of special design.

The Columbus Machine Company of Brooklyn are refitting their plant for the manufacture of electric car specialties. They have just purchased a down draft blacksmith forge system from the Buffalo Forge Company. The latter concern also sold a 6800 horse-power forced draft plant to the Brooklyn Heights Railroad Company for their Kent avenue station. The apparatus will consist of two large fans direct connected to engine.

The Chicago Pneumatic Tool Company have received an order from the New York, New Haven & Hartford Railroad for one of their largest sizes of compressors to be installed at Boston.

The Hawley Down Draft Furnace Company of 85 Liberty street have closed contracts with the International Steam Pump Company for five of their melting and refining brass furnaces. Three of the furnaces, consisting of two 60-inch and one 42-inch, are for the Blake-Knowles plant, one 42-inch is for the Snow plant and one 60-inch furnace will be installed at Elizabethport for the Worthington branch. They also received orders for furnaces of the 42-inch size from the Charleston Navy Yard and the New Jersey Tube Company of Newark, N. J.

Proposals will be received until Saturday, December 20, for furnishing engines, generators, boilers, &c., for a complete electrical power plant for the Frankford Arsenal, Philadelphia, Pa. Major Frank Heath is in charge of the work.

Proposals will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until December 16 for the navy yard, Mare Island, Cal., for a quantity of transformers, pipe and pipe specials, valves, hydrants, motors, steel roofing, electric cable, gauges, machine tools, also ice making and refrigerating plant for training station, San Francisco, Cal.

Boston Machinery Market.

BOSTON, MASS., November 22, 1902.

Favorable conditions still rule in the New England machinery and machine tools markets. The Boston dealers report good business, with many mail orders and a very encouraging run of store trade. As has been the rule this season the calls are not confined to special lines of machinery and tools, but cover the general range. All indications continue to point to a busy and fairly prosperous winter. There is no relaxation in the competition, especially for large contracts. While this often means small profits, it has not yet reached a dnagerous stage, nor are there any indications of such a result. Prices are well sustained, and there is a very noticeable tone of cheerfulness in the trade.

The dealers in second-hand machinery have little to say, except that they are still busy and see no cause for complaint in existing or prospective conditions. They report comparatively little transient trade, but many large orders. One dealer said that he was comfortably busy and that he was enjoying life more than he did when orders were so numerous and pressing that he was unable to fill them with reasonable promptness, which had been the case within the past six months.

The Walworth Construction & Supply Company are just completing a large contract for piping, &c., for the Oxford Paper Company of Rumford Falls, Maine.

The R. R. Sherman Company of Boston have issued a very handy booklet of "useful information for mechanics and engineers." It contains methods for determining heat, mechanical and electrical units and their relations; chapters on the theory of steam making, the efficiency of the engine and boiler, horse-power of boilers, feeding boilers, how impurities in water act on boilers, comparative fuel value of wood and valuable miscellaneous information. The booklet also contains a price-list of second-hand machinery that the firm have in stock.

Ellsworth, Maine, business men have formed the Ellsworth Shoe Company, who are to fit up a factory in that place.

The Saco & Pettee Machine Company are to build a new power house and a large shop in Biddeford, Maine, within the next year.

The Lowell Machine Shop, Lowell, Mass., has a large number of orders for machinery for the South, including one for the equipment of the Massachusetts company's new mill at Lindale, Ga.

In the Superior Court, November 14, Judge Braley issued a decree in the case of Lynch & Woodward *vs.* J. T. Cashman and others, including the Building Trades' Council and Steam Fitters' Union. The plaintiffs applied for an injunction restraining the labor unions from interfering with their business and from persisting in continuing strikes on certain buildings that the plaintiffs were constructing. The decree grants a temporary injunction restraining the defendants from interfering with the employees of the plaintiffs by representing to any employer of the plaintiffs that he would suffer loss or trouble by employing the plaintiffs; or from intimidating by threats of loss or trouble any person or corporation who have a contract with the plaintiffs; or from attempting to hinder the plaintiffs in their work or the performance of their contracts; or from attempting to coerce any employee into breaking his contract with the plaintiffs. This decree is of interest to all contractors, as it has such an important bearing upon labor troubles.

Samuel Eastman & Co., manufacturers of the Eastman nozzle for fire hose, are building a machine shop at East Concord, N. H.

At the close of the present theatrical season the Boston Museum will be demolished to make way for a fire proof office building, 11 stories high. Winslow & Bigelow of Boston are the architects, and they will call for bids for the steel probably within the next two months.

The passage of the new corporation laws in Maine, some two years ago, has led many Massachusetts corporations to organize in that State. In the year 1900, before the laws were changed, the State of Maine received $37,540 in organization fees, and from January 1 to November 1, 1902, the receipts from that source amounted to $75,095, practically all of which came from Massachusetts corporations. Among the latest reported from Augusta was the Bay State Forge Company, organized at Kittery, Maine, with a capital of $50,000. The company propose to manufacture horseshoes, calks and nails. Frank M. Furbush of Newton, Mass., is president and Horace Mitchell of Kittery, Maine, is treasurer.

The Damon Safe and Iron Works Company of Cambridge, Mass., have been placed in the hands of John R. Prescott of Newton, Mass., as receiver, by order of Judge Colt of

the United States Circuit Court. The company's financial troubles were mainly caused by the suspension of the Central National Bank of Boston, to which they owed $150,000. The company's total indebtedness amounts to $300,000, and their principal assets are their plant. The company were crippled by having a large amount of money tied up in contracts. The receiver will continue the business. The company were organized under Massachusetts laws in 1885, and succeeded the American Steam Safe Company, who in turn succeeded Deino & Roberts. These concerns constructed nearly all the United States Sub-Treasury deposit vaults.

The "Nevada," a single turreted monitor, was launched at the Maine (Maine) Iron Works' Yard last week, and was sent to the Charlestown Navy Yard to be docked and prepared for its trial trip.

Trade Publications.

Complete Steam Plants.—One of the handsomest catalogues we have ever received has been published by the Harrisburg Foundry & Machine Works, Harrisburg, Pa., describing their steam engines and boilers. This company are now operating an entirely new plant which, although only completed one year, is being increased by new buildings and machinery. This company have designed a complete scientific system of engines, the result of their long experience. This system provides a different style of machine for each changed sphere of conditions and service. It also provides a carefully graduated list of sizes for each style maintained in the system. This is so that there need be no forcing in the selection of an engine to a size too large or too small for the requirements. We appreciate the extent to which this company carry this method; it is only necessary to state that they have drawings and patterns for 22 types of engines intended to meet varying conditions. Each of these styles is closely graduated, and variously ranges from 6 to 3000 horse-power, comprising upward of 500 different sizes of drawings and patterns.

Analyses of Pig Iron.—S. R. Church, 307 Sansome street, San Francisco, Cal., is preparing a second volume of his "Analyses of Pig Iron," which will be ready for delivery on December 20. This volume will not be a repetition of the contents of volume one, but contains additional and entirely new analyses of the irons of the United States, Canada and other countries. It is the purpose to make this, taken in connection with the first volume, as complete a compilation of analyses of the pig irons of the world as can be brought together. The new volume will also contain highly valuable data regarding the fuel used in the production of irons, the capacity of the different furnaces, the character of ores used and statistics relating to production. The volume will further contain an article on the mixing of pig iron by Thomas D. West of Sharpsville, Pa.; another on Thomas iron, by F. H. Knight, assistant general superintendent of the Thomas Iron Company, Hokendauqua, Pa., and another on machine cast foundry pig iron, by Albert Ladd Colby, metallurgical engineer of the Bethlehem Steel Company, South Bethlehem, Pa. The illustrations will include views of furnace plants, cuts showing the fracture of the different pig irons and portraits of men prominently engaged in the pig iron trade. The price of this volume post-paid to points in the United States and Canada is $5, and post-paid to foreign countries, 24 shillings.

Perforated Metals.—The Harrington & King Perforating Company, 209 North Union street, Chicago, have brought out an effective advertising device in the form of a unique tinted postal mailing card, on the face of which are printed in six different colors *fac-similes* of their various Perforated metals. The cards are at once artistic, attractive and effective. In the upper left hand corner, on the reverse side of the card, is the trade-mark of the company, with the address 114 Liberty street, Engineering Building, New York City, from which branch office 25,000 of the cards are being distributed to the trade in New York City and vicinity.

Foundry Supplies.—H. S. Vrooman, Eighteenth place and Sangamon street, Chicago, Ill., is favoring the trade with a neatly printed pamphlet of 40 pages, calling attention to the high grade foundry facings and foundry supplies, fire brick and molding sands which he is prepared to furnish. The little work is profusely illustrated, and in regard to the illustrations Mr. Vrooman states that they are exact reproductions of the articles themselves, being evidently half-tone reproductions from photographs of the completed articles. The information presented is of a varied character, yet pertinent to the lines illustrated, and there are also tables showing the number of key brick required for various circles. The last page of the pamphlet is devoted to "Points on Fire Brick," in connection with which is a rule for finding the inside diameter of any circle by the dimensions of the brick.

The Rogers Universal Cost System.—Under the title of "An Industrial Problem," W. S. Rogers of Keene, N. H., publishes a little volume which contains a great many valuable suggestions for keeping costs, by which time and cost keeping are made easy. Blank forms are presented for cost cards for workmen, factory orders, material cards, waste cards, shipping orders, production books, contract cards, &c. Instructions are given relative to the equipment necessary for a factory to keep track of all items of cost, to cover all the accounts necessary for arriving at expenses and to secure a perfect system of following up orders in their passage through the factory. It is supplied at 10 cents per copy, post-paid.

Manifolds.—We have received from the General Manifold Company a handsomely illustrated publication which describes the plant of the company at Franklin, Pa., together with a description of the processes employed. The company own a new process for a dry, hard, clean manifolding preparation and the machinery for applying it in such a way as to constitute a new art, or a very great improvement on the old process of producing duplicate or multi-copied documents. An experimental plant was operated for more than two years in Chicago, where experiments were carried forward which developed the process. Subsequently the company founded the establishment at Franklin. The process they developed has been introduced in a large number of railroads and other establishments requiring manifold copies in the conduct of their business. The general manager of this company is Charles B. Holdredge, who was formerly manager of the railway supply department of Hibbard, Spencer, Bartlett & Co., Chicago.

Belt Conveyors.—The Stephens-Adamson Mfg. Company, Aurora, Ill., have issued an illustrated pamphlet on belt conveyors which are used in various industries for handling both raw and finished products. Among the conveying and elevating machinery referred to are plain, standard and self oiling dust proof carriers, self oiling mounted carriers and return rollers, standard mounted carriers and return rollers, self oiling flat belt carriers, standard flat belt carriers, self oiling return rollers and standard return rollers. Excellent illustrations are also given of some kinds of power transmitting machinery, including hangers, couplings, pulleys, sheaves, &c.

Iron and Industrial Stocks.

Following the severe shaking up which the stock market experienced from the 8th to the 17th, the past week has been rather quiet and uneventful in industrial stocks, with a marked exception in the case of Colorado Fuel. Three different factions are now said to be contending for the control of this company—namely, the Harriman-Hawley interests, the Osgood-Gould interests and the Gates faction. The stock fluctuated quite widely during the week, showing a range of six points on some days. The extreme range in prices on Colorado common stock was from 82¾ to 91. The fluctuations in other industrials were within quite narrow limits.

A special meeting of the stockholders of the Cambria Steel Company will be held at their office in the Arcade Building, Fifteenth and Market streets, Philadelphia, on December 18, 1902, at 3.30 o'clock p.m., for the purpose of voting upon an amendment to the by-laws providing that the Board of Directors shall be divided into three classes of three each.

Dividends.—The Railway Steel Spring Company have declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable December 20.

The Alabama Consolidated Coal & Iron Company have declared the twelfth dividend of 1¾ per cent. on the preferred stock, payable December 1.

The National Lead Company have declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable December 15.

The Consolidated Lake Superior Power Company have declared a quarterly dividend of 1¾ per cent. on the preferred stock.

Square Tubing.—To meet the numerous demands of their customers the Mackie Steel Tube Mfg. Company, Hammond, Ind., have begun the manufacture of square tubing and are at present making it 1 and 1¼ inches outside diameter, 16 and 14 gauge steel, brazed at the seam with a perfectly smooth surface, giving it the appearance of a seamless tube and making it impossible to detect the seam where it is brazed. All loss of strength at the seam is also prevented.

J. Wood & Brothers Company, Conshohocken, Pa., state that they have received the order for light plates for the new cup defender, to be rolled from nickel steel, to be furnished by the Bethlehem Steel Company. They have also in the past rolled the light sheets for all the cup defenders built by the Herreshoff Mfg. Company.

New York.

NEW YORK, November 26, 1902.

Pig Iron.—Buying continues on a moderate scale for prompt delivery, for which practically nothing is available except foreign Pig Iron. Reports from Middlesbrough show that vessels are loading and have been engaged to carry fully 60,000 tons during this month and December. Middlesbrough No. 3 is being freely offered, duty paid, at $18.75, and can be laid down at about $18.25. Some of the largest consumers have been buying additional quantities direct. Scotch Irons, equal quantities of No. 1 and No. 3, are selling, according to brand and quantity, at $20.50 to $22. For domestic Iron prices vary widely, according to time of delivery, &c. For the first half of 1903 the following quotations are made: Northern Iron, at tidewater, No. 1 X, $23.75 to $24.75; No. 2 X, $22.50 to $22.75; No. 2 Plain, $21.50 to $21.75. Tennessee and Alabama brands, in New York and vicinity: No. 1 Foundry, $24 to $24.50; No. 2 Foundry, $23.50 to $24; No. 3 Foundry, $22 to $22.50.

Cast Iron Pipe.—The demand keeps up longer than usual in the fall, caused to some extent by difficulty in securing needed supplies during the summer months. Small lots only are now being purchased, as it is too late for much Pipe laying to be done this year and too early for contracting for next season. Prices, tidewater delivery, are as follows: 6 and 8 inch, $36; 12-inch, $36.50; larger sizes, $35.75, gross ton.

Steel Rails.—Transactions are fairly numerous, but usually consist of small lots, as it is now difficult to arrange satisfactory deliveries on large quantities, the mills having their product sold so far into next fall. Inquiries aggregate a very large tonnage, some important systems having yet failed to cover their full requirements for 1903. It is likely that many electric projects may be deferred until 1904, because of inability to get the Rails needed next year, unless foreign Rails are ordered. Much talk is heard of probable buying abroad but little is being done. The domestic makers are striving in every way to prevent their customers from turning to foreign sources of supply. One Western and two Eastern roads have during the past week purchased an aggregate of 65,000 tons for 1903 delivery. The total tonnage booked for next year now foots up to close to 1,750,000 tons. We continue to quote $28 at Eastern mills for Standard Sections.

Finished Iron and Steel.—Several important local building contracts have been secured by the leading bridge company. Among them are the Barclay Building, Broadway and Duane street, 4000 tons; hospital on Thirty-fourth street, 1000 tons, and extension to telephone building on Cortlandt street, 1000 tons. Numerous other building projects are coming up. Bridge work is rather quiet, the Western railroad companies having apparently covered their requirements for next year. Considerable work of this character is in sight, but only small lots. Foreign competition is noted in the Gulf States, particularly by Belgian structural manufacturers. They are now bidding on work, manifesting a willingness to accept penalty contracts for early delivery. Eastern Plate mills are getting much business for the first quarter of next year. They are still having much trouble in making deliveries, owing to the congestion on Eastern railroads. One of the great works of Western Pennsylvania has been closed down by a serious accident to the machinery, the third repetition since the mill was completed. We quote, at tidewater, as follows, but for small lots and prompt delivery higher prices are being obtained for Structural Material and for Plates: Beams, Channels and Zees, 2c. to 2.25c.; Angles, 2c. to 2.25c.; Tees, 2c. to 2.25c.; Bulb Angles and Deck Beams, 2.10c. to 2.25c. Sheared Steel Plates are 2.10c. for Tank, 2.20c. for Flange, 2.35c. to 2.40c. for Fire Box. Refined Bars are 1.90c. to 2c.; Soft Steel Bars, 1.80c. to 1.90c. Foreign Beams are 1.75c. and Angles 1.80c., ex-ship, New York, in large lots.

Old Material.—Conditions are unchanged. The Eastern demand is light, except for Cast Scrap. Selling quotations are as follows, per gross ton, f.o.b. cars in this vicinity:

Old Iron Rails	$22.00 to $22.50
Old Steel Rails, long lengths	21.00 to 22.00
Old Steel Rails, short pieces	18.50 to 19.00
Relaying Rails, heavy sections	29.00 to 30.00
Relaying Rails, lighter sections	33.00 to 35.00
Old Car Wheels	19.50 to 20.00
Old Iron Car Axles	25.50 to 26.00
Old Steel Car Axles	24.00 to 25.00
Heavy Melting Steel Scrap	18.50 to 19.00
No. 1 Railroad Wrought Scrap Iron	20.50 to 21.00
Track Scrap	18.50 to 19.00
Busheling Scrap	14.50 to 15.00
No. 1 Machinery Cast Scrap	19.00 to 20.00
Stove Plate	13.00 to 14.00
Wrought Turnings, delivered at mill	16.00 to 16.50
Cast Borings, delivered at mill	9.50 to 10.00

Metal Market.

NEW YORK, November 26, 1902.

Pig Tin.—All support has been withdrawn from the market, and prices, both here and in London, have receded rapidly. There was a marked absence of activity, and the market dropped point by point, the tone being exceedingly weak. Closing prices here to-day were almost 1c. lower than last week, being as follows: Spot, 24.25c. to 24.50c.; November, 24.12½c. to 24.40c.; December, 24.12½c. to 24.35c. Arrivals during the month have been large, amounting to 2951 tons, of which about 2000 tons are still landing. The London market suffered a steady decline, reaching the lowest to-day and closing just £2 below last week's figures. Spot was quoted £111 and futures £110 5s. The unsettled condition of the Silver market has had a very unfavorable effect on the Eastern Tin market.

Copper.—Further weakness and continued decline of prices have characterized the market. The demand from consumers has been lighter than for some time past. Offerings were extremely heavy, but they failed to bring out purchasers. As an illustration of this can be mentioned an offer of 1,000,000 lbs. of December Electrolytic yesterday at 11.25c., but no bid could be obtained of more than 11c. Prices closed here as follows: Lake, 11.25c. to 11.50c.; Electrolytic and Casting, 11.12½c. to 11.25c.; Standard, 10.50c. Exports so far this month amount to 8777 tons. Judging from these figures at this late day the total exportation for the month will prove considerably smaller than last month, or, in fact, during the last three or four months. The London market declined to a point which is the lowest since January 27 of this year. Spot was quoted £49 18s. 9d., and futures £50 3s. 9d.

Pig Lead.—The market is entirely without change. The official quotation is based on 4.12½c. for spot Desilverized and 4.10c. for futures. The London market has declined to £10 13s. 9d.

Spelter—Is weaker and lower, both here and in the West. The market here is very weak, spot being nominally 5.20c., December nominally 5.10c. and St. Louis 4.90c. Despite the lower quotations here the London market advanced to £19 17s. 6d. yesterday, and closed to-day at that figure.

Antimony.—The market is unchanged and as follows: Cookson's, 9c. to 9½c.; Hallett's, 7¼c. to 7½c., and other brands, 7c. to 7¼c.

Nickel.—No change is noted. Large quantities down to ton lots are now quoted at 40c. to 47c. per lb., according to size and terms of order. Smaller lots are quoted as high as 60c., according to quantity.

Quicksilver.—The market is quiet and unchanged, the ruling quotations being $48 per flask of 76½ lbs. each in lots of 50 flasks or more. London is unchanged at £8 15s.

Tin Plate.—An increased amount of business is reported by the American Tin Plate Company at the new quotation, which is on a basis of $3.60 per box of 14 x 20 100-lb. Cokes, f.o.b. mill, and $3.79, f.o.b. New York. Representatives of outside mills are also reaping the benefits of lower prices, it being said that in some instances they have shaded the price of the American Tin Plate Company. Swansea is unchanged at 11 shillings 9 pence.

The railway between Buluwayo and Salisbury, South Africa, via Gwelo, a distance of 300 miles, was completed on the 7th ult. There is, therefore, now through rail communication between Cape Town and Beira. The completion of this new section will greatly facilitate the progress of the through Cape to Cairo line, as it will now be possible to supply railway material both from the Cape Colony and Beira ports. The line is laid for a distance of 80 miles north of Buluwayo in the direction of Victoria Falls. It is expected that the line will reach the Waukie coal fields early next year.

It is stated that the Norfolk-Hampton Roads Shipbuilding & Dry Dock Company, Norfolk, Va., who were organized early in the year, have secured 679 acres of land fronting on Hampton Roads, near Sewall's Point, where they propose to establish a large shipyard.

Reports in the daily press that all the offices of the constituent interests of the United States Steel Corporation are to be removed from New York to Pittsburgh are officially denied. No move of this kind is contemplated at the present time.

The employees of the Empire Iron & Steel Company, at Catasauqua, Pa., have made a demand for an increase in wages.

PERSONAL.

John Pender of John Pender & Co., horseshoe nail manufacturers, Brunswick, Victoria, Australia, who has been in this country for some weeks, is returning home *via* Chicago. Mr. Pender will sail on the "Ventura" from San Francisco on November 27.

Warren E. Willis has established an office in 318 Frick Building, Pittsburgh, as a designer of special machinery, in which lines he has been engaged for a number of years.

L. Muench, who was recently elected vice-president of the American Can Company, will retain his position as general sales agent of the company.

A complimentary dinner was given on November 20 by John Fritz, at his home in Bethlehem, Pa., to the members of the general committee who arranged the banquet given in his honor at the Waldorf-Astoria, New York, on October 31.

As a result of a general change in the official management of the Allis-Chalmers Company, Milwaukee, Wis., Edwin Reynolds, for many years general superintendent of the Edward P. Allis Company and chief engineer of the consolidated company, has been made the consulting engineer of the entire concern. Irving H. Reynolds, who was made general superintendent at the time of the change in official titles, is advanced to the position of chief engineer. The position of general superintendent remains vacant for the present.

Samuel Gompers was unanimously re-elected president of the American Federation of Labor last week at the annual convention of the Federation in New Orleans, La.

A. H. Fisher, formerly assistant manager of the crucible steel plant of William Jessop & Sons, Sheffield, England, has been made manager of the new plant of the Jessop Steel Company, at Washington, Pa. This plant was recently started.

Amos E. Gillespie, one of the superintendents at the Duquesne blast furnaces of the Carnegie Steel Company, has been tendered the position of superintendent of a new blast furnace being erected at Scottdale, Pa., and will probably accept.

E. V. Douglas, who has been president of the Consolidated Lake Superior Company from the beginning of the enterprise, has resigned, owing to the condition of his health, but will still remain a director. F. S. Lewis, vice-president, has been elected president.

George A. Bardwell will assume charge of the Philadelphia office of the Chicago Pneumatic Tool Company.

Miscellaneous Manufacturing.

The Reese-Hammond Fire Brick Company, Bolivar, Pa., have given their employees a voluntary advance in wages, ranging from 5 to 20 per cent., effective from December 1.

The Henry C. Mould Company, Empire Building, Pittsburgh, have secured a contract for a complete briquetting plant, with a capacity of 240 tons daily, which is intended to be shipped to the Companies Metallurgical de Torreon of Torreon, in the State of Coahuila, Mexico.

Merchants of Defiance, Ohio, have raised funds for the purchase of the Nightingale woolen mill property in that city and have closed a deal with the Lodi Steel Box Mfg. Company of Lodi, Ohio, to remove their plant to that place. The Lodi Company are to employ a stated number of men and the plant is to be turned over to them at the end of six months.

The Niagara Electro-Chemical Company have awarded the contract for an addition 200 feet long and 50 feet wide to John Sandstrum. It will be of brick and iron. This company's already large plant is located on the lands of the Niagara Falls Power Company, Niagara Falls, N. Y.

F. M. Underwood of the Toledo Motor & Machine Company has invented a gas heating outfit for houses or factories, and his company are planning to go into the manufacture of the article.

The Warren Sheet Metal Company, who recently organized at Warren, Ohio, with $50,000, to manufacture sheet metal products, have purchased a building site on the Erie Railway main line in that city and will break ground at once for their factory building, which will be a large one.

The Reserve Press Company, Cleveland, manufacturers of dies and presses for stove work, report having a large amount of work on hand, sufficient to keep them busy for several months. They are at work on a complete outfit of dies and presses for a new stove manufacturing concern soon to commence business.

The Cleveland Elevator Bucket Company of Cleveland, manufacturers of elevator buckets, have closed a contract for an equipment of about 3000 buckets for the Montreal Elevator Company, Montreal. The Steel Storage & Elevator Construction Company, Chicago, have the contract for the elevator.

The statement that the Bessemer & Lake Erie Railroad, controlled by the Carnegie Steel Company, were going to double their entire system from Conneaut to Butler, Pa., is untrue. It is a fact, however, that numerous sidings and much new equipment are being added by this road, which is being put in first-class shape for hauling the enormous tonnage of ore that will be brought down from the lakes next year. This road has the only direct connection with the Standard Steel Car Company, whose new steel plant is at Butler.

The American Steel & Copper Plate Company, 150 Nassau street, New York, have purchased a plot of ground at Fairmount and Cornelius avenues, Jersey City, N. J., upon which they will erect an up to date plant, plans for which are being prepared. The building will be of brick, 50 x 100 feet, and three stories high.

The plans for the new steel car plant of the Sterlingworth Railway Supply Company of Philadelphia, to be erected in Eddystone, are about completed. There will be a main building, 300 x 600 feet; boiler house, 50 x 145 feet, and office building, 50 x 100 feet, three stories.

A site has been purchased by the Kansas City *Star*, Kansas City, Mo., where they will erect a paper mill with a capacity of 1000 tons per month, practically all of which they will consume in their own printing plant. The plant is expected to be in operation by May, and it will be equipped with six 150 horse-power tubular boilers and one 450 horse-power Corliss engine, purchased from the Bass Foundry & Machine Company, Fort Wayne, Ind.; two 150 horse-power engines, not yet secured; two 115-inch paper machines from Rice, Barton & Fales, Worcester, Mass.; four beating machines and two Jordan engines from Jones & Sons, Wilmington, Del.

The Hall Safe Company, Cincinnati, Ohio, intend to erect a new plant, the location for which has not yet been decided upon.

F. A. Strauss & Co., are to spend $75,000 on additions to and new machinery for their worsted mill in Trenton, N. J., of which J. W. Foster is superintendent.

The Chicago Railway Equipment Company, Chicago, have commenced the construction of branch works upon property recently purchased at Delray, Mich. Only a portion of the tract of land will be built upon at present, but it is expected that at some time in the future additions will be made. Over 1200 feet of the property adjoins a joint track over which all the railroads in Detroit operate, thus affording the company excellent transportation facilities. In addition to the main plant in Chicago, and the one now being built at Detroit, they have a large branch works at Jersey City. All three plants will be operated to accommodate their business. The company may in the near future extend the line of their manufacture, which at present is confined to metal brake beams, side bearings and slack adjusters for railroad equipment.

The Electric Gate & Signal Company of Omaha, Neb., have been incorporated with a capital stock of $500,000. The incorporators are John C. Small, Geo. F. Hamilton, H. C. Chambers, B. A. Karr, J. A. Clark, W. M. Gaines, and Waldemar Michaelsen. The company organized by electing Geo. F. Hamilton, president; H. C. Chambers, vice-president; John C. Small, secretary-treasurer and general superintendent of construction. Mr. Michaelsen is connected with the Western Electrical Company of Omaha. The others interested are residents of Council Bluffs. The factory and offices of the company will be at Omaha. The patents controlled cover an electric gate for railroad crossings, a switch signal, an automatic semaphore and block system and an electrical alarm.

The Fall River Steamboat Line are asking bids for the construction of two new steamers, one for passenger service and one for freight. The "Pilgrim" and "Priscilla" of this line were built at Chester, Pa.

The Shelby Motor Car Company of Shelby, Ohio, have succeeded the Beardsley & Hubbs Company, who recently removed from Mansfield to Shelby, to take up the manufacture of gasoline automobiles. The capital stock of the company has been increased by $50,000 additional stock and the company will increase their facilities to produce three automobiles per week.

The Seneca Chain Company of Kent, Ohio, will erect an addition to their plant which will double their capacity.

The Aultman-Miller Company of Akron, Ohio, until recently leading manufacturers of harvesting machinery, are out of this business, having sold their plant to a combine, and have recently closed a deal for the purchase of the business of the Woodruff Automobile Company, owned by Cleveland people, but having a plant at Akron. The business will be continued at Akron and gasoline automobiles will be produced on a large scale.

HARDWARE.

THE gathering at New Orleans, in view of the great interests represented and the personality of those in attendance, justifies the large amount of space given to it in the last and present issues of *The Iron Age*. The National Hardware Association, including as it does most of the large jobbing houses of the country, though for various reasons the very largest are not actively identified with it, is thoroughly representative of jobbing interests, which it continues very efficiently to serve. In the American Hardware Manufacturers' Association most of the leading Hardware manufacturers are members, and the organization is under influences which make it more representative of manufacturing interests in the Hardware field than any other organization in the history of the trade. Being under the direction of broad minded men of position and ability, who are supported by many other manufacturers of prominence, there is every reason to expect that beneficial results, not only to the manufacturers but through them to the trade at large, will result from the consideration given to existing problems.

While the coming together of the jobbers and the manufacturers in joint session was an admirable feature of former conventions, as tending to promote acquaintance and maintenance of close personal relations, a definite advance was made at the New Orleans meeting in having these two great interests unite in executive session in the discussion of a practical question in which both of them are directly and deeply interested. Instead of inviting mere generalities of compliment, as has often been the case in former gatherings, there was at the late convention an attempt to reach some conclusion, or at least to get some light upon a practical question which has often been discussed without result or conclusion. The attempt on the part of the jobbing trade in conjunction with the manufacturers to reach some reasonable ground in regard to syndicate buying deserves the approval of the trade. Whether or not it is found feasible or desirable to reach any definite conclusion or to inaugurate or maintain any policy which shall have the approval of the organizations in question, there is no doubt that the consideration of the subject in formal joint convention is in accordance with correct principles.

The debate on this question is, however, an illustration of the difficulty which besets the consideration of such a practical problem by a large body in which there are many conflicting views and interests. There is apt to be an indirectness in such public or semipublic utterances, an overlooking sometimes of the fundamental facts in the case, and a tendency to give undue weight to considerations that militate against frank and straightforward statements. The coming together of jobbers and manufacturers to discuss such a question has, however, promise of good in one way or another, and in this case the fact that prominent syndicate buyers indicate a disposition to confer in regard to their methods and clients was a concession that came as something of a surprise and tended in some measure to disarm opposition and criticism.

The New Orleans conventions are an illustration of the advantage there is in the coming together of representatives of two great classes of trade. It was made possible by the organizations in successful operation of both jobbers and manufacturers. But the gathering in the Crescent City was representative of but two out of the three great classes into which the Hardware trade is divided. If it could be found feasible to have also the representation of the retail Hardware interests at these annual or semiannual gatherings, it would be a further step in advance. These retail interests are already well organized in many of the States, and have a strong and efficient national organization. The presence of representatives of these organizations at the great gatherings of manufacturers and jobbers, from whom are purchased the goods of which the retail merchants are the distributors, would seem to be in accordance with the spirit of the times, and a fitting return for the courtesy extended by such retail associations to the official representatives of the National Hardware Association. If this could be accomplished it would add a new significance to the meetings and make them representative of the trade as a whole, in a way which at present is not the case. That it would tend to bring the various interests closer together cannot be doubted, and if well managed would seem to be to the advantage of the manufacturer, jobber and retailer, and would certainly tend to promote that knowledge of one another's interests and that recognition of one another's rights which is essential to a satisfactory solution of any problem in the trade.

Condition of Trade.

Considering the time of year orders are coming in quite liberally, covering the general line of staple Hardware for immediate requirements. Prices are generally well sustained on this class of goods. Few orders are being received for deliveries extending beyond the present year. On Sheets and Sheet Steel Goods and Heavy Hardware the demand is moderate. A reduction in prices on the general line of Pieced and Stamped Tinware is being considered by the manufacturers of these goods. The congestion of freight traffic at Pittsburgh has been practically ended for the present by clearing the main lines and relieving local conditions so that cars can be moved more freely. The activity in general business is reflected in the extraordinary demand for transportation facilities on the larger systems, which continues unabated. Those roads which but a short time ago believed that they had plenty of cars to handle business now find that they are short of both cars and motive power. The voluntary advance in wages of 10 per cent. made by the Pennsylvania Railroad has been generally followed by those roads throughout the country which were not already paying approximately the wages which have been reached by the recent advance. In addition to indicating the prevailing prosperity these advances will probably call for advance in freight rates, accompanied by a withdrawal of the reduced tariffs which have been issued during the past year. This, of course, will affect every shipper of goods, and tends to give strength to values. Its influence in inducing further advances in wages generally must not be overlooked. Thus in various ways the market is affected favorably, so far as tone in the matter of prices is concerned, but there is a possibility that the impression that prices are at least sufficiently high may be strengthened and the demand curtailed.

Chicago.

(By Telegraph.)

The consolidation of the Sharon and Union companies with three other mills in the East, with a capitalization of $50,000,000, is looked upon by large interests as indicating a more settled market for Nails, Wire and such

other products as have recently suffered from keen competition. That the combination is an assured fact is verified in this market, and there seems reason to believe that a harmonious working arrangement will be made between the two largest interests, which will insure a steady, profitable business for many months to come. The rumors of lower prices are not credited here. There is a very heavy tonnage in both Wire and Nails, daily, weekly and monthly sales running much in excess of the volume of business transacted during the corresponding periods of 1901. There is a more satisfactory tonnage in Sheets also, although the market is still slightly disturbed by cuts in prices. The price of Rivets has been reduced $3 a ton, and manufacturers of Sash Weights have advanced prices about 10 per cent. during the past few days, $30 per ton now being demanded in this market. The advance is based on high prices and scarcity of Scrap, and the difficulty of obtaining Coke. This advance is regarded as somewhat premature, however, especially in the face of an easier tendency in Pig Iron and a better outlook for fuel. The trade is much interested in the outcome of the meeting of the manufacturers of Builders' Hardware in New York this week. An advance in prices is anticipated, but there are reports that this cannot be accomplished at the present time. The keen competition which is still experienced in Strap and T Hinges is extending to Butts, and some interesting developments are expected within the near future. The trade is also awaiting with some interest the result of the meeting of the manufacturers of Cut Nails in New York, lower prices on Steel Cut Nails being anticipated by some, but there is much difference of opinion, and in view of the developments of the past few days any decline seems improbable. The colder weather of the past few days has stimulated the buying of seasonable goods, and jobbers are quite busy making shipments to the nearby trade. The buying of holiday goods has also been resumed to a considerable extent. The demand for Shovels is very light at the present time, but trade is being stimulated somewhat by lower prices made by independent manufacturers, who are meeting the new schedule of the combination, which went into effect on the 15th inst., by slight reductions necessary to secure business.

St. Louis.

(By Telegraph.)

The report of trade from the Hardware jobbers' standpoint for the current month is a most satisfactory one, and the total sales will compare most favorably with recent high averages. Orders for spring goods are on the increase and such items as Lawn Mowers, Garden Tools, and products of an agricultural character are prominent items. It is said that the delay in receipt of many different kinds of goods from the manufacturers is due largely to the difficulty in securing the malleable castings, which are a part of various articles. The break in the price of Shovels, Spades, &c., has resulted in a general buying movement, the volume of which is very large. It is remarked that the sale of Grain Scoops the past season has been of a phenomenal order. General conditions are very sound, and every indication points to an enormous early spring trade.

NOTES ON PRICES.

Wire Nails.—Wire Nails are in better demand than for some time, and general conditions of the market are fairly satisfactory. Specifications on old contracts are coming in more freely. Quotations are as follows:

Jobbers, carload lots	$1.85
Retailers, carload lots	1.90
Retailers, less than carloads	2.00

New York.—The demand for small lots from store keeps up exceptionally well for the season. Quotations are as follows: Single carloads, $2.05; small lots from store, $2.10. The latter price is sometimes slightly shaded.

Chicago, by Telegraph.—The volume of business in Wire Nails is quite large, the tonnage booked showing a large daily increase over the business transacted in November last year. The business is especially satisfactory, as the new orders booked show as much relative gain as specifications on old contracts. The situation as a whole is much better than it has been for months, prices being better maintained, with the prospect of an even stronger market in the near future. If lower prices are being made in the South, which seems doubtful, the fact is due to concessions in freight rates, and not to lower prices made by mills. Official prices remain steady at $2 in carload lots and $2.10 in less than carload lots, mill shipment, Chicago.

St. Louis, by Telegraph.—Trade continues as before, and the demand for Wire Nails from the jobbers is in very moderate volume. Small lots are quoted at $2.15.

Pittsburgh.—The merger of the Union-Sharon Steel Companies into one concern, to be known as Union Steel Company, is of particular interest to the Wire Nail trade. The new Union Steel Company have a combined capacity at Donora and Sharon for turning out about 7000 kegs of Nails per day. There is a fair movement in Wire Nails, but new business is not satisfactory to the manufacturers. The tone of the market is only fairly strong. We quote Wire Nails at $1.85 in carloads to jobbers, $1.90 in carloads to retailers and $2 in small lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days. For galvanizing Nails 75 cents per keg is charged and for tinning Nails $1.50 per keg extra.

Cut Nails.—At the monthly meeting of the Cut Nail Association, held this week, the price of Cut Nails for November was reaffirmed for the month of December in territory east of Buffalo. No change was made in Steel Cut Nails in the territory west of Buffalo, but in that territory Iron Cut Nails were advanced 15 cents per keg. A very firm feeling developed at the meeting in regard to sustaining prices. Nails made from imported steel billets are being exported to some extent. This is made possible by the drawback on the duty allowed on goods exported which are manufactured from imported material. The market is reported as being firm at the following quotations: $2.05, base, in carloads, and $2.10 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms, 60 days, less 2 per cent. off in 10 days.

New York.—There is a steady demand in the local market for Cut Nails, in small lots from store. The market is firm at the following quotations for carloads and less than carloads:

Carloads on dock	$2.18
Less than carloads on dock	2.23
Small lots from store	2.30

Chicago, by Telegraph.—While there has been no special activity, there has been a fair volume of business and the market has ruled steady for both Steel and Iron. While some jobbers anticipate lower prices on Cut Nails as a result of the meeting of the manufacturers in New York this week, recent developments in manufacturing lines seem to be against any reduction. This market has remained steady on the basis of $2.15 in carload lots and $2.20 to $2.25 in less than carload lots, Chicago.

St. Louis, by Telegraph.—Jobbers continue to quote Cut Nails from store in small lots at $2.30.

Pittsburgh.—There is a fair volume of business, but orders are for carloads or less quantities. Iron Cut Nails bring about 10 cents advance over Steel. We quote Steel Cut Nails as follows: $2.05, base, in carloads, and $2.10 in less than carloads, plus freight in Tube Rate Book to point of destination, terms 60 days, less 2 per cent. off in 10 days.

Barb Wire.—Specifications on contracts are not coming in for Barb Wire as freely as was anticipated. A good demand exists in some sections of the country, while in other sections the trade are showing a disposition for various reasons to defer purchases. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$2.15	$2.45
Retailers, carload lots	2.20	2.50
Retailers, less than carload lots	2.30	2.60

Chicago, by Telegraph.—New orders are being received in quite liberal volume, the largest manufacturers showing a material gain over the business transacted in November last year. The month of October was especially heavy and from present indications November will be even more satisfactory. Prices are being well maintained, notwithstanding the report that some Southern markets are having an advantage in freight rates, and present indications denote rather a strengthening than a weakening of the market. Official quotations for Galvanized are as follows: $2.60 for carload lots and $2.70 in less than carload lots, while Painted is sold at $2.30 in carload lots and $2.40 in less than carload lots, Chicago. There is a good demand for staples and the market is steady at $2.05 in carload lots and $2.15 in less than carload lots.

St. Louis, by Telegraph.—The demand for Barb Wire shows no increase in volume and jobbers report the sales as being of a light order. Painted at $2.50 and Galvanized at $2.80.

Pittsburgh.—There is only a fair demand, which is still very unsatisfactory to the manufacturers. Specifications on old contracts are not coming in very freely. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days: Painted, $2.15; Galvanized, $2.45, in carload lots to jobbers; Painted, $2.20; Galvanized, $2.50, in carloads to retailers; Painted, $2.30; Galvanized, $2.60, in small lots to retailers.

Plain Wire.—The general tone of the market is firm, with a moderate demand. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.75
Retailers, carloads	1.80
Less than carloads	1.90

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	Plain.	Add Galv.
6 to 9	Base.	$0.30
10	Advance over base	$0.05 .30
11	" " "	.10 .30
12 and 12½	" " "	.15 .30
13	" " "	.25 .30
14	" " "	.35 .30
15	" " "	.45 .60
16	" " "	.55 .60
17	" " "	.70 1.00
18	" " "	.85 1.00

Chicago, by Telegraph.—Both specifications on old contracts and new orders have been received in liberal volume during the week, there being a more confident undertone than has been the case for many weeks. Prices in this market are well sustained, carload lots selling at $1.90 on track and $2 from store, while Galvanized sells at 30 cents extra.

St. Louis, by Telegraph.—Plain Wire comes in for a light demand at this time and jobbers continue to quote in small lots from store No. 9 at $2.10 and Galvanized at $2.40.

Pittsburgh.—The tone of the market is fairly firm, but the volume of new business is small. We quote Plain Wire, $1.75, base, for Nos. 6 to 9 in carloads to jobbers, $1.80 in carloads to retailers and $1.90 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

Cotters and Spring Keys.—The market for these goods is very irregular, and has become an open one, the arrangements for an agreed price having ceased November 14. This was largely brought about by the entrance of new competitors, the most of which competition originates in the West. There appears to be no uniform price, but it is said orders are being taken from large customers at about one-half the former ordinary prices.

Shovels, Spades and Scoops.—Underhill, Clinch & Co., 94-96 Chambers street, New York, have issued a new price-list and discount sheets, under date of November 15, 1902, of Shovels, Spades and Scoops manufactured by Oliver Ames & Sons Corporation, for whom they are agents.

Tinware.—There are some indications of impending concessions in the prices of Kitchen, House Furnishing and Kindred Utensils made of Tin Plate, as for instance Stamped and Pieced Tinware, &c., but which at this writing does not seem to have been definitely decided on by the larger companies working together on prices. One reason for such a reduction is the new prices on Tin Plates effective December 1, based on Coke Plates, now $4 a box, but $3.60 per box next month. Another reason is the competition that has been increasing in volume since the formulation of agreed prices, evidence of which is found in the occasional cutting of prices on certain items of leading staple Tinware made by outside makers and marketed mainly among the smaller trade, but who are continually strengthening their position with the jobbers and larger concerns.

Rivets.—A meeting of the Rivet Manufacturers' Association was held in the Hotel Lincoln, Pittsburgh, last week. The purpose of the meeting was to discuss trade conditions and make certain adjustments in prices of Rivets, some inequalities existing which it was desired to remove. The meeting was attended by some 15 or 16 concerns and a number of Pittsburgh manufacturers of Rivets who have not heretofore been identified with the Rivet Manufacturers' Association were present and will act in harmony hereafter. Some slight changes in prices were made, but these were in the nature of readjustments. Demand for Rivets was reported to be large, but competition on some kinds has been quite keen for some time.

Screws.—As a matter perhaps having bearing on the Screw market, it is of interest to note that the American Screw Company have purchased the plant and good will of the Massachusetts Screw Company.

Poultry Netting.—There is a feeling of uncertainty in the market as regards Poultry Netting, owing to an impression which prevails that two or more of the large jobbers have placed orders at prices ruling before the advance at which most of the trade have purchased for next season, so that such houses are in a position, if they desire to use their opportunity, to sell the largest trade at the same price as the manufacturers do. This is a line in which jobbers have been ready to sell at an unreasonably close margin, and to encourage them to hold up prices a suggestion has been sent by manufacturers recommending that jobbers do not sell at a greater discount than 80 and 17½ per cent., but many of them will doubtless quote a higher figure.

Cordage.—A weak fiber market and light demand has caused lower prices in the Rope market. Manila Rope is quoted, on the basis of 7-16 inch and larger, at 11½ to 12¼ cents per pound, according to maker. Sisal Rope, on the same basis, is quoted at from 8½ to 10 cents per pound, according to quantity. A quarter of a cent rebate is obtainable on large orders.

Glass.—It is understood that included in the agreement, which it is expected the individual jobbers of the National Window Glass Jobbers' Association will soon ratify, is that the association agree to take 450,000 boxes of Glass per month for six months. It is reported that the first allotment will be made early in December, and at regular intervals thereafter, probably each month, with an increase in price at each allotment. It is understood that the American Federation and Independent Window Glass companies, who are working in harmony, have agreed not to sell to any one who is not a member of the jobbers' association, except at an advance of 10 per cent. on their base current price, except in the strictly Pacific Coast States, which is to be considered as an open market, with certain limitations in price. If the plan is carried out the associated manufacturers will revise their price-list, making the price on the first three brackets low enough to enable jobbers to sell American Glass in these brackets in competition with foreign Glass in all sections of the country. On the larger sizes the list will be advanced to offset the reduction made on the first three brackets. The amount of Glass to be contracted for may not take all the Glass the combined factories are able to make. While they are not now op-

erating more than one-half to two-thirds of their pots, owing to a scarcity of workmen, it is probable that the output will be regulated to correspond with the needs of the trade. The consummation of the agreement will assure higher prices for Glass. The Jobbers' Association quotations are as follows, for single and double strength Window Glass:

	Discount.
From store	88 and 5 %
F.o.b. factory, carload lots	89 and 5 %

Oils.—*Linseed Oil.*—The condition of the Linseed Oil market is peculiar. Buyers do not care to purchase and crushers do not care to sell. Local business for small lots of Oil has fallen off so that demand is very light. There is no placing of orders for future delivery. The largest interest have been selling Oil stored in their tanks and have just commenced running their mills, so that they are temporarily out of the market. Independent crushers have sold Oil about as fast as they have made it. City Raw is quoted, according to quantity, from 46 to 47 cents per gallon. State and Western brands are quoted, on the same basis, from 45 to 47 cents.

KENTUCKY CHAIN COMPANY'S CATALOGUE.

THE KENTUCKY CHAIN COMPANY, Frankfort, Ky., have just issued an illustrated descriptive catalogue of the diversified Chain products manufactured by them, some of which are Coil, BB, Brake, Switch, Check, Well, Safety, Breeching, Hobble, Trace, Halter, Butt, Stage, Wagon, Harness, Breast and Wagon Chains, Chain Dogs, Chain Hooks, Cow Ties, Repair Links and various other goods of this character. To protect their customers against unwarranted complaints the company test every individual Chain, we are advised, as a guard against burnt or poorly welded links, and by the same process as used by the United States Government.

S. F. BOWSER & CO.

S. F. BOWSER & CO., Fort Wayne, Ind., issue catalogues and pamphlets describing their specialties, including Self Measuring Oil Outfits for the economical, clean and convenient storage of Oils, which are designed for use in retailing; Adjustable Measure Shop Oil Cabinets, designed for storing and handling lubricating Oils, and for use in shops, mills, manufacturing plants, light and power plants, engine rooms, &c.; Long Distance Gasoline Storage Outfits, by which arrangement the tank is buried in the ground at any desired distance from the building, and connected to pump located at any convenient point in the building by means of piping; together with outfits for handling Paint, Oils, Varnishes and other nonlubricants.

BINDLEY MERCHANDISING COMPANY.

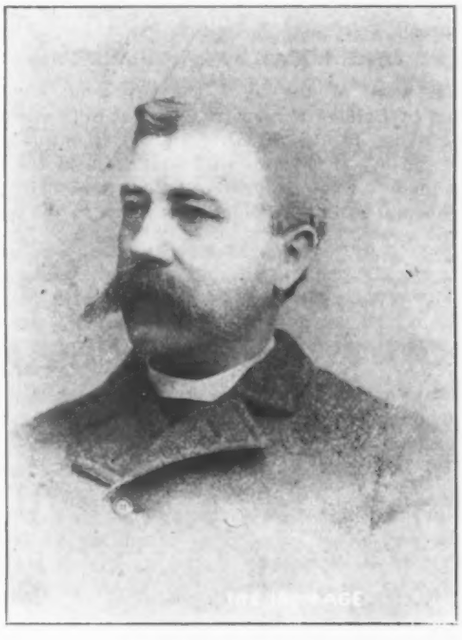
THE BINDLEY MERCHANDISING COMPANY of Pittsburgh have applied for a charter of incorporation. The incorporators are John Bindley, Edwin Bindley, E. J. Lloyd, W. H. Cochrane, John Reitz and W. J. Mercer. The Bindley Merchandising Company will be an identified interest of the Bindley Hardware Company of Pittsburgh, but will not effect the present organization of that concern in any way. The charter is taken out for the purpose of giving the Bindley Hardware Company larger privileges and a wider field.

BUTLER BROTHERS, New York, Chicago and St. Louis, issue regularly about the middle of each month, and frequently at irregular intervals, "Golden Rod" sheets which are referred to as containing nothing but bargains. The one for the month of November is devoted to bargains for the Christmas trade. These bargains are designed to provide customers with special goods for their advertising or show windows.

ARMSTRONG, WALLS & CO., 45 Centre street, New York, have recently been appointed selling agents for New York, New Jersey, Rhode Island and Connecticut, in connection with the Universal Swivel and Bottom Swivel Vises, made by the Jacobson Machine & Mfg. Company, Warren, Pa. These Vises were fully illustrated in these columns July 10 last. The Jacobson Universal Friction Swivel Machinists' Vise can be used in an upright position or lifted off its fixed base and turned on its side in either direction, swinging around an entire circle, if necessary, at the same time by a turn of the Screw locking both work and body of Vise instantaneously and rigidly in any position. The Friction Swivel Bottom Vise is similar in all features except that it turns horizontally on its base only.

DEATH OF EDWIN S. SWEET.

EDWIN S. SWEET, late of Sickels, Sweet & Lyon, died November 13, at his country home in Salisbury, Conn., after a lingering illness. He was born in Williamsburg, afterward the eastern part of Brooklyn, in 1839. Early in his business career he was employed by Walsh, Coulter & Co., New York, as city buyer, later going to Mooney, Cohu & Co. in the same capacity. When the latter house went out of business they were in part succeeded by Louderback, Gilbert & Co., then at 23 Park row and afterward 53 Chambers street, Mr.



EDWIN S. SWEET.

Sweet remaining with the new concern as an employee, from which station he was afterward advanced to a junior partnership, later becoming a member of the house of Gilbert, Sweet & Lyon, from which he withdrew in 1888. In 1900 on the withdrawal of Mr. Gilbert, the senior member of Gilbert, Sweet & Lyon, the new firm of Sickels, Sweet & Lyon were organized, from which Mr. Sweet retired in 1897.

The subject of this sketch was educated in the public schools. At the beginning of the Civil War he went to the front, where he served under General Sheridan. Owing to some oversight or negligence the company to which Mr. Sweet belonged was not mustered into the United States service until three months after it actually became a part of the fighting force, during which period he was wounded. Some years afterward when applying for a pension on account of the wound received at that time, it was refused because of this irregularity. After the war closed he joined the Twenty-third Regiment of Brooklyn, going to Hornellsville, N. Y., with the regiment as an officer at the time of the great railroad riots in 1877.

Mr. Sweet was an honorable business man and had a good reputation for truth and honesty, and his fairness in trade was unquestioned. He was an able Hardwareman and was highly esteemed by his competitors, being considered at one time the most successful Hardware salesman in Northern New York. Mr. Sweet is survived by a widow and six children.

THE NEW ORLEANS CONVENTIONS.

CONCLUDING REPORT.

THE report given in our last issue supplemented by the further report contained in the following pages will indicate the importance and success of the gathering, in which the great interests of the jobbing trade and of the manufacturers were considered by some of their ablest representatives. In point of numbers, as well as in the importance of the subjects discussed, the convention will bear comparison with any that have preceded it, while the tone of the gathering and the cordial hospitality extended by the Crescent City tended to make it an exceedingly enjoyable occasion. The discussions of practical questions by the manufacturers' association were ably conducted and the papers presented were of an unusual degree of excellence.

THE LOCAL ARRANGEMENTS.

The work of the local Entertainment Committee, headed by Colonel Eshleman, who was ably seconded by A. Baldwin, Jr., R. K. Hireman, W. R. Stauffer, E. J. Cope and W. M. Pitkin, was admirable in the general plans made for the convention before its opening and in the constant attention which was given to the delegates

and the ladies during its continuance. The two great Hardware houses on whom the burden of entertainment fell gave practically the entire week to the convention, notwithstanding the fact that there must have been a good deal of interruption to the regular course of business in their establishments on account of the engrossment in the duty of hospitality of so many important men. The matters connected with the transportation of the delegates were attended to with exceptional care and skill by Harry N. Moore of Stauffer, Eshleman & Co., who was the railroad secretary of the convention and was also active and unremitting in his courtesies to those in attendance. The success of the effort to secure rates by which the round trip was covered for a single fare was much appreciated.

MANUFACTURERS' REPRESENTATIVES.

A large number of manufacturers were represented at the convention and a number of those having wide acquaintance with the trade had place on the Reception Committee and were exceedingly useful in carrying out the plans made by the local committee for the entertainment of their guests. The various functions afforded the visitors, such as the excursion to the sugar plantation, expeditions through the city, attendance at the opera and the banquet, were managed with exceptional success.

THE MANUFACTURERS' ASSOCIATION.

The work of the American Hardware Manufacturers' Association was regarded by those identified with it as exceedingly successful and full of promise. The organization has grown in strength during the year and by the action taken on various matters has confirmed the impressions of those who believed that it might be made useful in promoting the interests of the manufacturers as well as the trade at large. Experience has shown that there are many matters in which there is sufficient unity of interest among the members to justify them in reaching practically unanimous conclusion without in

any way interfering with the methods or plans of any. It is felt, too, that much advantage results from manufacturers coming together and discussing trade tendencies and problems. The former officers of the association were re-elected, and Fayette R. Plumb of Philadelphia thus continues as president and Robert Garland of Pittsburgh as chairman of the Executive Committee.

THE OUTLOOK FOR BUSINESS.

The coming together of so many of the most prominent Hardware merchants and manufacturers in the country afforded an excellent opportunity for an interchange of views as to the prospects for trade and the probable course of the market. The general impression seemed to be that a continuance of active business well into next year is to be anticipated as a result of the great prosperity which is prevalent, and notwithstanding the weakening in prices, actual or prospective, of some staple lines. In this connection the following statement of his view of the outlook from one of the most prominent merchants in the country will be read with interest:

Views of a Prominent Merchant.

The most interesting question of the day, to every merchant, is as to what the near future will bring forth, and by this we comprehend particularly those months that embrace the period of the spring trade. What will happen after July 1, 1903, is a question we can safely leave to the professional prophets and soothsayers, for in this regard one man's guess is quite as good as another's.

The problem presents itself in the question as to whether we are on the crest of the wave or whether the tide has already begun to recede, or, in the language of Wall Street: "Is the good news all out?"

In this connection, whatever conservative men may think of Wall Street speculators, it cannot be gainsaid that the Street is the most sensitive record we have of the currents and changes of commercial life, and that it, likewise, has a fashion of anticipating things, both good and bad, far in advance. The attitude of the Street to-day seems to be that stock values, as a rule, are based upon an abnormally prosperous condition that in the nature of things cannot last much longer, and that sooner or later there must come a readjustment to a lower average level.

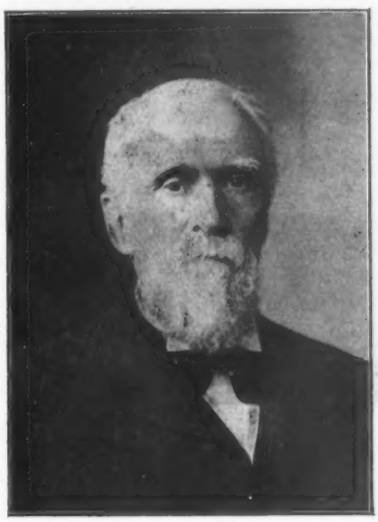
On the face of affairs the conclusion seems irresist-

ible that the present demand, upon which the whole fabric of prosperity rests, is almost sure to continue into the early summer until the vital question of crops, with its attendant uncertainties, comes around again.

It is superfluous to recapitulate here the story of phenomenal railroad earnings, of unprecedented movement of merchandise, of record breaking crops and of enterprises of such pith and moment as fairly bewilder us with the magnitude of their scope. Yet beneath all this there runs an undercurrent of doubt, which finds expression in the query as to how much longer this will last.

If we analyze the commercial situation we find it divides itself into two apparently conflicting conditions. There have been of late sweeping reductions in some of the leading products of the United States Steel Corporation, and it is evident that these changes mark the beginning of the long deferred fight between the giant corporation and their outside rivals. Other reductions may be expected to follow in the course of time and as may be necessary, for some of the outside competition is too strongly intrenched to be knocked out in the first round—indeed, it is an open question to be proved only by experience as to whether some of the outsiders may not have staying powers equal to any contest.

These reductions in prices do not necessarily mean



R. A. KIRK.

that a falling off in demand has been experienced in all these lines—though this is true in some cases—but are indications of the determination of the central corporation to hold their trade against all comers and at all hazards.

The immediate effect of these reductions has been a sudden revival in demand brought about by the feeling that it was now safe to buy, and a distinct discouragement to many small competitors who now realize, what every close observer has long known, that the time was inevitable when every small competitor of the great Steel Corporation must drop out of the game and leave the field to those, and to those only, who harked back to the original ore and fuel.

Each fresh reduction in price may be expected to be followed by a still further reduction, up to a certain limit in productive capacity, consequent upon the dropping out of those who are unable any longer to endure the stress of the conflict. It may be taken for granted, however, that there will still exist more than enough capacity to supply any normal demand.

Such seems to be the probable story of the staple lines in Steel and Iron, so long as the present conflict prevails between the Steel Corporation and their outside competition; a steady, though probably slow, reduction in prices, as the necessities of the case may demand, but nothing of a nature that is liable to unsettle the market or to check demand. It is among the possibilities that a very great demand in the spring might stiffen prices quite sensibly for the time being.

Turning from staple goods to that innumerable lot of items which make up so great a part of the Hardware business, a condition prevails that certainly calls for our special wonder. From every side comes the story of a demand that outstrips all precedent and of manufacturers hopelessly behind on their orders, despite great additions to their plants and their productive capacity.

In many lines of goods it is impossible to get an order filled within 60 or 90 days, while quite a number are from four to six months behind, and still the flood of orders comes pouring in upon them without decrease and without cessation.

The situation has been aptly described by a very close and experienced observer in the remark that "In small Hardware there are not enough goods made at present to go around."

It takes a long time to increase the production of certain lines, such as Builders' Hardware, Shelf Hardware, Edge Tools, Carpenters' Tools and the like, and any additions started now could not possibly be available within the next six months.

In small Hardware, therefore, for the next six months it promises to be a question solely of ability to produce goods enough, and it looks as if the wise buyer was he who got in his orders early on this class of goods. Naturally, no declines in price of these goods need be looked for while these conditions prevail, and it is more than likely that some advances will occur.

It is obvious enough that sooner or later the prices of small Hardware must follow the downward tendency of staple goods, but that time is not yet in sight, for small Hardware being last to feel the rising impulse will also be the last to start on the down grade.

In any complete analysis of the subject it must be borne in mind that our present prosperity rests upon three great facts: The generally good condition of the farmer, the enormous activity in railroad building, betterments and equipments, and the unprecedented impulse in building.

The farmer seems to be assured of good returns for his products for some months to come, and the commitments in railroads and building are so great and so far advanced that practically nothing can stop them for the first half of next year.

In spite of these facts let us not forget that building materials are getting so high as to check new enterprises, that slowly but surely production is overtaking consumption in all lines, and that while the near future offers a great promise of making hay while the sun shines, it will be wiser to do all business only as our wants may necessitate and to eliminate entirely the element of speculation.

CANADIAN WHOLESALE HARDWARE ASSOCIATION.

The Canadian Wholesale Hardware Association were represented at the convention by Messrs. Lee and Handley, respectively president and secretary. On being presented to the delegates, Mr. Lee made the following address:

PRESIDENT LEE'S ADDRESS.

It is indeed a great pleasure that we are permitted to attend your annual convention, and have an opportunity of visiting this interesting City of New Orleans. The reception that you have given to me as President of the Canadian Wholesale Hardware Association is indeed more than I ever could have anticipated, coming as I do from the North,—I might say a foreign country, but speaking the one tongue. It is but right that we should admit that we look upon your organization as our parent, and feel that if we should follow in your footsteps, it will be no experiment. The power and influence of your association, with its large membership, covering such a large territory, makes us feel, in Canada, that our organization is indeed very small.

But, gentlemen, we have a territory as well, stretching from the Atlantic to the Pacific, and I am proud to say with the increased immigration, the increased manufactories, and the industries that are being established, the railways that are being constructed, and the

general development of our country proceeding at such a rapid rate, that we hope before long that we will be equally powerful.

Our business in Canada is conducted in a somewhat different manner to what you are accustomed to. With the protection which your government has afforded to manufacturers, you are enabled to practically purchase all your supplies in your own country. With us it is different. But, gentlemen, we are opening such magnificent mines of coal and iron ore, and establishing such works for the development of same, that before long it may be truly said that this Great North American Continent, speaking one tongue, must and will control the hardware trade of the world. I am glad to report that we have the prosperity which has spread over this country. Long may it continue so.

In conclusion, Mr. President, permit me, on behalf of the Canadian Hardware Association, to thank your members for the many kindnesses so often extended to our members, and for the valuable information so cheerfully and willingly given by your capable secretary, Mr. Fernley, and we only hope that you will give us at no late date an opportunity of reciprocating the same.

SECRETARY HANDLEY'S REMARKS.

Mr. Handley was then introduced, and spoke as follows:

It is my privilege to stand before you once more and convey my thanks for the generous and hearty consideration that I have always received at your hands.

Mr. President, Mr. Lee has practically conveyed to you in a few words everything that the Canadian members can say. I have, however, the honor to convey to you, gentlemen, a resolution that was passed at the annual meeting of the Canadian Wholesale Hardware Association, as follows:

> That a cordial vote of thanks be passed to the National Hardware Association of the United States for its kind and cordial reception and entertainment of the delegates sent by this association.

I take great pleasure, gentlemen, in submitting that resolution. If we can give you any information as to the methods and manner in which we do our business in Canada, we shall be pleased to do it. Gentlemen, I thank you.

SYNDICATE BUYING.

Probably the most important subject considered by the associations was that of syndicate buying, a matter which had been previously canvassed by both organizations, in anticipation of the conventions. The discussion in regard to the matter was looked forward to with interest, which was subsequently justified by the course of things.

Following upon the consideration given the question in the executive sessions of the separate associations, there was a joint discussion of the subject at a meeting largely attended by both jobbers and manufacturers. The debate which ensued was an interesting one, if not entirely satisfactory in getting at the fundamental facts in the case and the principles underlying the question. There seemed to be a disposition on the part of the manufacturers to lay on the jobbers the responsibility for the existing system of syndicate buying, inasmuch as the jobbers are the patrons of the system, and have thus given it countenance by their support. The jobbers, on the other hand, were disposed to lay on the manufacturers the responsibility, because of their relations with the syndicate buyers. There was much divergence of views expressed, but while there was a general recognition of the fact that there are abuses connected with the system, no definite conclusion was reached, and the joint meeting adjourned without action.

The manufacturers were more free in expressing decided opposition to syndicate buying than were the jobbers, whose aim seemed to be not so much to do away with the system, which they would probably regard as an impracticable attempt, as to use their influence with the syndicate buyers to prevent them from having retail houses on their lists, to whom thus jobbers' prices are quoted.

Two of the prominent syndicate buying houses indicated a willingness to confer with the National Hardware Association in regard to the matter, and it is therefore likely that there will be conferences between the two interests with a view of ascertaining if it is practicable to have an understanding which will remove at least some of the objectionable features which are detrimental to trade interests as a whole.

HOSPITALITY.

While the gathering was distinctly for business purposes, it was rendered especially enjoyable by the lavish and very considerate and sincere hospitality which was shown, not only by the Hardware houses of the city, but by the people generally. Too much credit cannot be given to Stauffer, Eshleman & Co., and A. Baldwin & Co., who, as representing the jobbing interests of the city, made the meeting the great success which it unquestionably was. Their admirable arrangements, provided long in advance, and their unremitting attentions during the session of the conventions, supplemented as they were by the cordial and courteous reception given by the citizens generally, made a deep impression upon their guests, every one of whom carried away a new impression of Southern hospitality as exemplified and emphasized by the treatment accorded them in the chief city of the South.

JOHN C. KOCH.

That the people of New Orleans added to their reputation for hospitality is putting the case mildly. A series of entertainments, receptions, boat and carriage rides, theatre parties, etc., were arranged for, and the delegates and manufacturers were kept going from early morn till late at night.

A reception was tendered the delegates in the Palm Garden of the St. Charles Hotel on Wednesday evening, which was one of the brilliant affairs of the conventions. New Orleans society turned out *en masse* to welcome the delegates, who deeply appreciated the many attentions they received. Souvenirs were distributed by the Entertainment Committee, consisting of miniature bales of cotton, miniature bags of rice, boxes of candy, etc. The evening was delightfully spent, and wound up by dancing until well into the morning.

Some six hundred delegates, manufacturers and their ladies boarded the steamer City of St. Louis, for a visit to the Stanton sugar plantation. The party landed at the plantation after an hour's pleasant ride on the river, the principal points of interest being shown to visitors by the committees appointed for this purpose, and were then shown throughout the entire plantation. It was a revelation to the majority of those in the party, and much interest was displayed in the ingenious machinery used in the making of the sugar. Miniature barrels filled with sugar made at this plantation were presented to those in the party. On the return trip to the city lunch was served, and the party landed at 5 o'clock.

The committee had made arrangements for nearly the entire seating capacity of the Opera House, and on Thursday evening the Opera House was visited by the

ladies and their escorts. After the opera, carriages were provided to carry the guests to their hotels.

The ladies, under the guidance of a local committee, visited the old French section of New Orleans, which is replete with interest. Some two hours were spent in this manner, and the ladies were thus given an opportunity of seeing that part of New Orleans which has made it famous.

THE JOBBING HOUSES OF NEW ORLEANS.

Many of the Hardware merchants and manufacturers availed themselves of the opportunity to visit the Hardware houses of Stauffer, Eshleman & Co., and A. Baldwin & Co., and of paying their respects to their principals, most of whom, however, were unremitting in their attentions on the floor of the conventions, or in the lobby of the hotel. Isaac H. Stauffer, senior member of the house of Stauffer, Eshleman & Co., and the oldest wholesale Hardware merchant in the country, was the recipient of much attention and many congratulations in view of his long and prominent identification with the trade, and the intellectual and physical vigor which permit him still to

BRACE HAYDEN.

take active part in the transaction of the business of the great house of which he is the honored head.

Many of the delegates took interest in visiting the fine building of A. Baldwin & Co., and noting the extent and completeness of their arrangements, and the admirable business methods which characterize their care of their large trade. Their visits to these houses and their contact with the principals impressed upon the delegates the growing improvement of New Orleans as a Hardware market.

The house of Woodward, White & Co. was also visited by many of the delegates. This house, as the trade are aware, has for many years had a prominent position as jobbers of groceries and mill supplies, as well as ship chandlery goods, but have of late been giving increased attention to Shelf and Heavy Hardware, in which they are now doing a large business.

IRRIGATION.

At the joint session of the two associations held on Thursday evening, principally for the discussion of syndicate buying, the subject of irrigation was presented by the secretary of the National Irrigation Association, who made an interesting address in regard to the importance of irrigation and its influence in advancing trade interests. At the conclusion of his remarks the following resolutions were offered by Mr. Kretsinger and unanimously adopted:

Resolved, That the reclamation of the arid land of this country and the maintenance of irrigated communities already created demand the preservation of the forests as sources of water supplies.

Resolved, That we commend the recommendations of President Roosevelt in his message to Congress on the subject of forestry and irrigation, and urge the enactment at the coming session of Congress of a law which will fully carry into effect his recommendations as to forestry and bring together the various branches of the forestry work of the National Government under the Forestry Bureau of the Department of Agriculture, with appropriations adequate to enable the National Government in cooperation with States to effectively safeguard our forests from destruction.

Resolved, That we congratulate the country on the passage of the National Irrigation act, and express our profound appreciation of the aid and co-operation of President Roosevelt and all friends of that measure in the Senate and House of Representatives in securing the passage of that act. We believe this action by Congress marked the conception of one of the greatest projects ever undertaken by any Government, and that it inaugurates a new era in the progress of this nation and the development of its internal trade and commerce and the enlargement of the home market for all our manufacturers. That the irrigable arid lands, which are estimated to comprise an area of over 100,000,000 acres, can and should be reclaimed just as rapidly as settlers will take them and repay the Government the cost of the irrigation works built for their reclamation. That we especially commend that feature of the act which reserves the reclaimed land for actual settlers and home makers only, and urge that in the future administration of the public domain this policy should be extended to include all public lands and to this end that the Desert Land act and the commutation clause of the Homestead act should be repealed. We urge every member of this association to be a member of the National Irrigation Association, and we further urge that each and all of our members should do whatever is practicable to enlarge the membership of the National Irrigation Association and in every way possible aid the work of that association in maintaining an active and correct public sentiment as to forestry and irrigation and organizing the friends of the national irrigation movement so that their influence may be united, and therefore effectual.

Resolved, That the president of this association be and is hereby authorized to act and represent this association as a member of the National Advisory Board of the National Irrigation Association, and in the event of his inability to attend any meeting of such board then to appoint a representative in his place from among the members of this association.

RESOLUTIONS.

At the closing session of the National Hardware Association the following resolutions were presented by a committee consisting of Geo. E. King, H. H. Rudd and F. F. Beals, and were unanimously adopted by a rising vote:

Resolved, That the thanks of this association be tendered the ladies of the Reception Committee of New Orleans. We have had conventions in all parts of the country, but at no place have we been the recipients of more courtesies or kindnesses than we have received at the hands of the ladies of this city.

Resolved, That we most cordially thank the local Entertainment Committee, composed of the members of the firm of A. Baldwin & Co., Stauffer, Eshleman & Co. and Woodward, Wight & Co., who have been untiring in their efforts to serve us and to make our stay in their city a pleasant one.

Resolved, That the thanks of this association be tendered to Mr. Moore, the efficient railroad secretary of the National Hardware Association.

Resolved, That the thanks of this association be tendered H. Van Newkirk for his efficient services as journal clerk of the convention.

Resolved, That the thanks of this association are tendered to the Entertainment Committee of the American Hardware Manufacturers' Association, which has contributed so much to the comfort and pleasure of the delegates.

Resolved, That the thanks of this association be tendered the railroads for giving us reduced rates, and to the Adams Express Company for their liberal treatment in transporting the official records of this convention.

Resolved, That the thanks of the association be tendered to the owners and managers of the New St. Charles Hotel, who have added so much to the comfort of the delegates to the annual convention of the Hardware Association. We realize the difficulties attendant upon the handling of such a large body of men, and congratulate the management upon the fact that all difficulties have been so ably overcome.

Coming here as we do from all sections of our common country, we shall feel in leaving that we know each other better, and express the wish that hereafter there may be no North, no South, no East, no West, but that we are all citizens of a united and glorious country, and we shall carry with us nothing but the sweetest memories of the courtesies and the unbounded Southern hospitality shown us by the good people of this city.

OFFICERS OF THE NATIONAL HARDWARE ASSOCIATION.

At the morning session, November 21, the Committee of Nominations, consisting of the following gentlemen, E. W. Morley, Saginaw; W. D. Krenson, Savannah; Hobart Weed, Buffalo; C. G. Bogue, Detroit; Clark Merchant, Philadelphia; A. S. Burwell, Seattle; S. A. Bigelow, Boston, made the following nominations of officers for the ensuing year, who were unanimously elected:

President.—R. A. Kirk, St. Paul.

First Vice-President.—John C. Koch, Milwaukee.
Second Vice-President.—Brace Hayden, San Francisco.
Members of the Executive Committee.—P. E. Strauss, Boston, Mass.; John Freeman, Detroit, Mich.

INAUGURATION OF OFFICERS.

In accordance with the precedent established at the former meeting of the convention, the officers of the National Hardware Association were publicly inducted into office at an open meeting, in which manufacturers as well as jobbers were represented. When R. A. Kirk, who was re-elected president, rose to speak, he was given a very hearty greeting, and made an interesting address in which he touched upon the work of the association and its importance. From his address we make the following extracts:

As members of this association our work is of a two-fold character. First, with reference to our relations to manufacturers on the one side and the retail dealer on the other side, we are between those two great representative bodies of business men. We claim to be the natural agency for the distribution of goods. We claim that if we conduct our business on proper lines we are entitled to consideration from manufacturers as the distributers of goods; that we are entitled to proper jobbers' differentials. That is one of the great contentions of our association—the fact which we have stated from the first and shall stand on until the last. We ask from the manufacturer proper consideration of us as the distributers of these goods, feeling that we are the legitimate channel for such distribution, and that we can distribute these goods to much better advantage than the manufacturer himself can do.

On the other hand, we stand as related to the retail dealer with a great deal of mutuality of interests. We are doing all in our power to build up the legitimate retail Hardware dealer, and everything that we can do in this direction we are trying to do.

We are not a large body of men—less than 200 members in our association. We do not need to be necessarily a large organization in order to do the work that is before us. We do represent in the main the Hardware interests of the United States. You can count upon the fingers of your two hands all the wholesale Hardware houses in the United States that we would desire today to have added to our membership. We have many applications for membership from those that we feel are not entitled to membership in this organization. We simply want this organization to stand for those men who are legitimate wholesale Hardware dealers. We draw the line as between ourselves and other Hardwaremen. They may have a small end to their business in Hardware, but the main part of their business is in some other line of wholesalers. We draw the line as to them, and wish to confine our efforts to those men who are engaged in the legitimate wholesale Hardware business. In this work we are ably seconded by the efforts of manufacturers—we may say very much. We have but little reason to complain. The great body of the manufacturers of the country are willing to listen to us when we go to them with reasonable requests. We make it our part to ask for nothing from them that we feel they should not justly grant to us.

At the conclusion of his remarks a handsome gold mounted gavel was presented to Mr. Kirk by Col. B. F. Eshleman on behalf of the jobbers.

John C. Koch of Milwaukee, who had been elected first vice-president, and Brace Hayden of San Francisco, who had been elected second vice-president, as well as P. E. Strauss of Boston and John Freeman of Detroit, newly elected members of the Executive Committee, were introduced to the meeting and acknowledged the honor shown them in appropriate remarks.

PLACE OF NEXT MEETING.

There was some question, until the closing session, as to where the next meeting of the association should be held. The cities suggested were Boston, Saratoga Springs and Atlantic City. When the matter came up for action, the latter was adopted by unanimous vote.

TRIP OF THE NEW BRITAIN PARTY TO NEW ORLEANS.

The party left Jersey City on Thursday, November 13, occupying two private cars, in charge of J. H. McCormick of the Norfolk & Western Railroad, the party being made up as follows: Charles H. Parsons, Charles Glover, W. E. Bartholomew, Chas. B. Parsons, of P. & F. Corbin; Geo. W. Corbin, Geo. L. Corbin, C. H. Baldwin, of Corbin Cabinet Lock Company; Chas. F. Smith, Geo. M. Landers, Fred. Huggins, of Landers, Frary & Clark; Geo. J. Laighton, Howard S. Hart, Benjamin Hawley, of Russell & Erwin Manufacturing Company; Alex W. Stanley, Robert N. Peck, of Stanley Rule and Level Company; L. H. Pease, A. E. Duncan, W. E. Stevens, of Stanley Works; Norman P. Cooley, of Hart & Cooley Co. With the party were also Col. R. S. Woodruff, of C. S. Mersick & Co., New Haven; Geo. Boole, of Schwabacher Hardware Company, of Seattle, Wash.

The first stop was made at Knoxville, on Friday, the 14th, where three hours were spent. The party was given a carriage ride about the city, under the direction of representatives from the following houses: C. M. McClung & Co., Woodruff Hardware Co., George Brown, S. B. Luttrell & Co. and McClung, Buffat & Buckwell.

T. JAMES FERNLEY.

Saturday, the 15th, was spent at Nashville, the entertainment being in the hands of representatives of the following houses: Gray & Dudley Hardware Company, Buford Bros., Keith, Simmons & Co., H. G. Lipscomb & Co., J. H. Fall & Co.

A trolley-car ride about the city, including a visit to the State Capitol, was first on the programme. Luncheon was served at the University Club, there being present Gov. Benton McMillan and Colonel Collier, president of the Chamber of Commerce. After luncheon the party were given a tally-ho ride to the Belle Meade stock farm.

Sunday was spent at Chattanooga, the day being occupied in visiting the Chickamauga battle fields, Missionary Ridge and Lookout Mountain. The party were accompanied by representatives of the following Hardware houses: Tom Fritts Hardware Company, Magill Hardware Company, Green & Caldwell, F. H. Woodward & Co. and Hall & Melton Hardware Company.

Monday was spent at Atlanta, the entertainment opening with a trolley ride about the city in the morning. Luncheon was given at the Piedmont Driving Club. The party were also presented to Gov. Joseph M. Terrell, at the State House, and to Mayor Livingston Mimms and J. K. Orr, President of the Chamber of Commerce, at the City Hall. The balance of the day was spent in visiting the trade at their stores. The party was in the hands of representatives of the following houses: Beck & Gregg Hardware Company, King Hardware Company, Anderson

Hardware Company, J. M. Alexander & Co., Dickens & Davidson, Hightower & Kirkpatrick.

Tuesday, the 18th, was spent at Birmingham. A special train was furnished by the Louisville & Nashville Railroad. The trip included visits to the mines and furnaces and steel industries of the city, luncheon being served on the cars by the Hardware merchants of the city, who accompanied the party, representing the following houses: Moore & Handley Hardware Company, May & Thomas Hardware Company, Mayberry Hardware Company, Prowell Hardware Company, Milner & Kettig Company.

The party left Birmingham in the evening, and arrived in New Orleans at Wednesday noon.

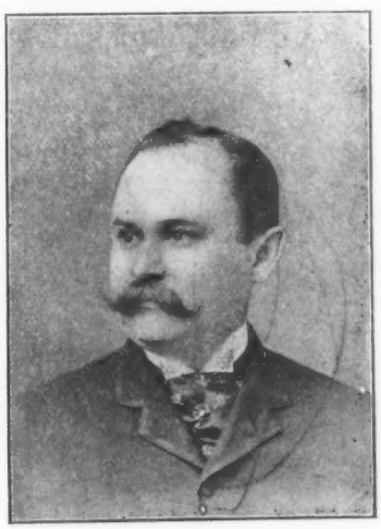
SOUVENIRS.

Many of the manufacturers came to the convention provided with souvenirs, which were distributed freely, and were appreciated.

Among the concerns who thus remembered the delegates were the following:

PIKE MFG. COMPANY, Pike Station, N. H.: A convenient and neatly mounted Whetstone.

MAYER & CO., Philadelphia, as calling attention to



FAYETTE R. PLUMB.

their Gold Medal Files and Rasps, gave the delegates cigars covered with gold foil and contained in a box with a Manicure File.

IVER JOHNSON'S ARMS & CYCLE WORKS, Fitchburg, Mass.: An elegant silver Match Box.

MCCAFFREY FILE COMPANY, Philadelphia: A neat Manicure File in leather case.

READING HARDWARE COMPANY, Reading, Pa.: Handsome hanging plaque representing Cupid Disarmed. The plaque is a fine example of the brass founders' art. A neatly printed card, which accompanied the plaque, called attention to the fact that the Bronze Hardware which is produced by them is made by the same artisans under precisely similar conditions.

BARRETT MFG. COMPANY, New Orleans: A useful Pocketbook.

BEALL BROS., Alton ,Ill.: Well made and convenient Key Rings.

MCKINNEY MFG. COMPANY, Allegheny, Pa.: Diary for 1903, containing also much useful information.

NATIONAL SWEEPER COMPANY, Marion, Ind.: Handsome watch fob, consisting of silk guard and ornamented with gold plated miniature Sweeper. Unfortunately only a few of these souvenirs were delivered in season to be distributed, but it is the intention of the company to mail these souvenirs direct to the delegates.

CLEVELAND TWIST DRILL COMPANY, Cleveland, Ohio: A polished bronze stick pin carrying the name of the company on a four-cornered panel, suspended to which was a miniature Twist Drill.

THE HOPKINS & ALLEN ARMS COMPANY, Norwich, Conn.: A regulation Rifle, inscribed with the firm name and address and the words "Souvenir, New Orleans, 1902."

THE ATHA TOOL COMPANY, Newark, N. J.: Tiny gold Hammers in the shape of stick pins.

G. & H. BARNETT COMPANY, Philadelphia: Handsomely made Nail File in leather case.

THE GOODELL COMPANY, Antrim, N. H.: A silver plated Orange Knife in satin lined box.

E. C. ATKINS & CO., Indianapolis, Ind.: Deck of cards in leather case, the cards being specially printed, each carrying on its reverse side the well-known trade-mark of this concern.

CHICAGO FLEXIBLE SHAFT COMPANY, Chicago: Attractive lithographed picture showing a stable scene with their Horse Clipper in operation. This picture was handsomely framed in ebony.

THE INTERNATIONAL CUTLERY COMPANY, Fremont, Ohio: Hand forged Razor, in a leather case, suitably inscribed.

J. D. WARREN MFG. COMPANY, Chicago, manufacturers of Hardware Shelving, Cabinets, &c.: Leather card case and a set each of playing cards and card dominoes, each inclosed in handsome leather case.

THE EASTERN GRANITE ROOFING COMPANY, New York: Nickel plated Cigar Perforator.

O. P. SCHRIVER & CO., Cincinnati, Ohio, distributed their I. X. L. Tool Box, containing Saw, Brad Awl, Gimlet, Chisel, Screw Drivers, &c.

THE ATTENDANCE.

When New Orleans was determined upon as the place of meeting for the two conventions there was some doubt expressed as to whether distance would not interfere with the attendance. The result, however, justified the wisdom of the selection, and both manufacturers and jobbers were present in large numbers, making, on the whole, one of the most successful and certainly most enjoyable gatherings in the history of the organization. The thoroughly representative character of the attendance is evidenced in the following list of those who were present, many of whom, it must be remembered, were accompanied by ladies:

Jobbers Attending the Convention.

ALABAMA.

Moore & Handley Hardware Co., Birmingham, J. D. Moore.
Mayberry Hardware Co., Birmingham, W. A. Chenoweth.
May-Thomas Hardware Co., Birmingham, Mr. Thomas.
Barney-Cavanaugh Hardware Co., Mobile, G. R. Vaughn.
Cunningham Hardware Co., Mobile, C. A. Cunningham.

ARKANSAS.

Fones Bros. Hardware Co., Little Rock, J. A. Fones, T. Van Dokkum.

CALIFORNIA.

Dunham, Carrigan & Hayden Co., San Francisco, Brace Hayden.
Holbrook, Merrill & Stetson, San Francisco, Jno. F. Merrill.

COLORADO.

Geo. Tritch Hardware Co., Denver, Geo. Tritch.

CONNECTICUT.

C. S. Mersick & Co., New Haven, Col. R. S. Woodruff.

DISTRICT OF COLUMBIA.

F. P. May & Co., Washington, Geo. J. May.

FLORIDA.

S. B. Hubbard Co., Jacksonville, S. B. Hubbard, Jr.

GEORGIA.

King Hardware Co., Atlanta, Geo. E. King.
Palmer Hardware Co., Savannah, A. B. Palmer.
J. D. Weed & Co., Savannah, W. D. Krenson.

ILLINOIS.

Geo. W. Trout & Co., Chicago, Geo. W. Trout.
Clark, Quien & Morse, Peoria, C. D. Clark, F. E. Smith.
Isaac Walker Hardware Co., Peoria, J. T. Neilson.
Tenk Hardware Co., Quincy, Rudolph Tenk.
Morehouse & Wells Co., Decatur, C. M. Hurst.

INDIANA.

Van Camp Hardware & Iron Co., Indianapolis, Cortlandt Van Camp.

IOWA.

The Empkie-Shugart Co., Council Bluffs, F. H. Hill.
Knapp & Spencer Co., Sioux City, C. A. Knapp.
Huber & Kalbach Co., Oskaloosa, J. S. Hayes.
Cutler Hardware Co., Waterloo, F. H. Cutler.

KANSAS.

W. A. L. Thompson Hardware Co., Topeka, James G. Bauer, J. Smith

Hockaday Hardware Co., Wichita, Newton Hockaday.
A. J. Harwi Hardware Co., Atchison, W. H. Harwi.
Blish, Mize & Silliman Hardware Co., Atchison, J. B. Silliman.

LOUISIANA.

A. Baldwin & Co., Limited, New Orleans, A. Baldwin, A. Baldwin, Jr., Hy. F. Baldwin, Gus B. Baldwin, R. K. Hireman, W. M. Pitkin, E. J. Ross, F. J. Campbell, C. D. Augustin, A. Steiner.
Stauffer, Eshleman & Co., New Orleans, I. H. Stauffer, W. R. Stauffer, B. F. Eshleman, D. Perret, Sidney Eshleman, E. I. Cope, H. M. Moore, W. L. S. Gordon, W. F. Goodrich, Nils Herlitz, J. R. Nagel, Hy. Chalaron, W. Donnelly.

MAINE.

Emery-Waterhouse Co., Portland, Wm. Chamberlain.
N. H. Bragg & Son, Bangor, C. F. Bragg.

MASSACHUSETTS.

Bigelow & Dowse Co., Boston, S. A. Bigelow.
Fitz, Dana & Co., Boston, P. E. Strauss.
Austen & Doten, Boston, H. L. Doten.
A. C. Harvey Co., Boston, Chas. W. Henderson, Jr.

MICHIGAN.

Standart Bros., Detroit, Geo. G. Bogue.
Freeman, Delamater & Co., Detroit, Jno. Freeman.
Morley Bros., Saginaw, E. W. Morley.
Foster, Stevens & Co., Grand Rapids, C. C. Philbrick.

MINNESOTA.

Hackett, Walther & Gates Hardware Co., St. Paul, T. G. Walther.
Farwell, Ozmun, Kirk & Co., St. Paul, R. A. Kirk, F. B. Platt, Everett B. Kirk, F. W. Hurty.

MISSOURI.

Wyeth Hardware & Mfg. Co., St. Joseph, Huston Wyeth, A. J. Warner.
Richards & Conover Hardware Co., Kansas City, John Conover.
Townley Metal Co., Kansas City, G. E. Garland.
Rogers & Baldwin Hardware Co., Springfield.

MONTANA.

A. M. Holter Hardware Co., Helena, D. P. Patenaude.

NEBRASKA.

Rector & Wilhelmy Co., Omaha, W. S. Wright, P. C. Deval.
Lee-Glass-Andreesen Hardware Co., Omaha, H. J. Lee.

NEW YORK.

Albany Hardware & Iron Co., Albany, C. H. Turner, Jas. K. Dunscomb.
Weed & Co., Buffalo, Hobart Weed.
Beals & Co., Buffalo, P. P. Beals.
Barker, Rose & Barker, Elmira, Capt. Fred. Barker.
Irving D. Booth, Elmira, Irving D. Booth.
Russell & Erwin Mfg. Co., New York, Geo. J. Laighton, B. A. Hawley, W. P. Hudson, J. H. Van Newkirk.
Mathews & Boucher, Rochester.
Weaver, Palmer & Richmond, Rochester, D. D. Palmer.
J. M. Warren Co., Troy, H. S. Darby.

OHIO.

McIntosh, Huntington Co., Cleveland, Geo. T. McIntosh, H. H. Bishop.
Geo. Worthington Co., Cleveland, H. H. Rudd.
H. W. Leutkemeyer & Sons, Cleveland, E. H. Leutkemeyer.
Kruse & Bahlmann Hardware Co., Cincinnati, Felix Bahlmann.
Bostwick, Braun & Co., Toledo, Geo. A. Braun.

PENNSYLVANIA.

Supplee Hardware Co., Philadelphia, W. W. Supplee, J. S. Bonbright.
Biddle Hardware Co., Philadelphia, Robt. Biddle, Edward Knight.
W. H. & G. W. Allen, Philadelphia, Henry F. Chorley.
T. James Fernley, Philadelphia.
Logan-Gregg Hardware Co., Pittsburgh, P. L. Logan, Robt. Reiff.
Jas. C. Lindsay Hardware Co., Pittsburgh, A. J. Bihler.

TENNESSEE.

C. M. McClung & Co., Knoxville, Bruce Keener.
Orgill Bros. & Co., Memphis, Jos. Orgill.

TEXAS.

F. W. Heitmann & Co., Houston, F. A. Heitmann.
Maroney Hardware Co., Dallas, Jas. Maroney.

VIRGINIA.

W. S. Donnan Hardware Co., Richmond, W. S. Donnan.

WASHINGTON.

Seattle Hardware Co., Seattle, R. P. Ballard, A. S. Burwell.
Schwabacher Hardware Co., Geo. Boole.

WISCONSIN.

Frederick Kroner Hardware Co., La Crosse, John C. Kroner.
Jno. Pritzlaff Hardware Co., Milwaukee, John C. Koch.

Manufacturers and Other Visitors.

Chicago Hardware Co., Chicago, John R. Hoagland.
Landers, Frary & Clark, New Britain, Conn., Chas. F. Smith, Geo. M. Landers, Chas. S. Williams, Fred. M. Huggins.
Reading Hardware Co., Reading, Pa., John E. Harbster, G. N. Jacobi, Fred S. Stellwagen, W. H. Bennett, T. B. Hendrickson, Chas. Packard, Fred. Magee.
Brinly-Hardy Co., Louisville, Ky., Lewis R. Hardy.
Clyde Cutlery Co., Clyde, Ohio, R. B. Jones.
Russell & Erwin Mfg. Co., Geo. J. Laighton, J. H. Van Newkirk, W. P. Hudson, B. A. Hawley.
John S. Sanders, Atlanta, Ga.
E. C. Atkins & Co., Indianapolis, Ind., N. A. Gladding, Harvey Avery, W. L. Sanford.
Cleveland Twist Drill Co., Cleveland, Ohio, Edward G. Buckwell, J. A. Wilson.
C. S. Smith Mfg. Co., Milwaukee, Wis., A. W. Wagner.
Crucible Steel Co. of America, Pittsburgh, C. M. Fouché.
Wood Shovel & Tool Co., Piqua, Ohio, S. S. Gould.
American Steel & Wire Co., Chicago, D. A. Merriman, T. H. Taylor, J. J. Gilmore.
Clendenin Bros., Baltimore, Md., Geo. H. Harper.
Lawson Mfg. Co., Chicago, Evans Nelson.
National Sweeper Co., Marion, Ind., T. H. Bedell.
The Atha Tool Co., Newark, N. J., Edward Ingalls.
Ludlow-Saylor Wire Co., St. Louis, Frank Low.
Lalance & Grosjean Mfg. Co., Chicago, P. W. Holmes.
Enterprise Mfg. Co., Philadelphia, C. W. Asbury, W. P. Smith, L. W. Klahr.
New York Belting & Packing Co., New York, Chas. F. Aaron.
The Avery Stamping Co., Cleveland, Ohio, H. W. Avery.
C. M. Avery & Co., Chicago, C. M. Avery.
G. & H. Barnett, Philadelphia, A. W. Barnett, Thos. Almgill, Jos. M. Hottel.
St. Louis Shovel Co., St. Louis, J. C. Birge, Walter Birge.
American Tin Plate Co., New York, Frank Dickerson, Geo. Shaw.
Winchester Repeating Arms Co., New York, Irby Bennett.
Kirk-Latty Mfg. Co., Cleveland, Ohio, S. D. Latty.
American Axe & Tool Co., New York, S. W. Baker, F. E. Corey.

ROBERT GARLAND.

Terre Haute Shovel & Tool Co., Terre Haute, Ind., Sam Burrell.
Simonds Mfg. Co., Fitchburg, Mass., Dan'l Simonds, C. F. Braffett, G. K. Smith.
Jno. H. Graham & Co., New York, R. P. Boyd, W. J. Lockwood.
P. & F. Corbin, New Britain, Conn., Chas. H. Parsons, W. E. Bartholemew, G. L. Haven, Chas. Giover, G. A. Overton, Chas. B. Parsons.
Oneida Community, Kenwood, N. Y., Alfred Clark, P. B. Noyes.
Wadsworth-Howland Co., Chicago, W. A. Campbell.
American Fork & Hoe Co., Cleveland, Ohio, W. H. Cowdrey, F. S. Kretsinger.
Lake Erie Iron Co., Cleveland, Ohio, F. W. Davis.
American Sheet Steel Co., New York, H. M. Davis.
J. M. Warren & Co., Troy, N. Y., H. S. Darby.
National Sewing Machine Co., Belvidere, Ill., Hy. Darling, F. P. Eldredge.
Davenport Fire Arms Co., Norwich, Conn., W. C. Davenport.
Iver Johnson's Arms & Cycle Works, Fitchburg, Mass., Thomas Ellis, J. L. Johnson, Geo. F. Salisbury.
Grafton Stone Co., Elyria, Ohio, J. H. Faxon, F. S. Miller.
Pittsburgh Steel Co., Pittsburgh, Pa., F. H. Forman.
Speet Steel Co., New York, Chas. L. Gilpen.
Standard Chain Co., Pittsburgh, Pa., J. C. Schmidt, Robt. Garland, J. E. Pumphrey.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass., A. H. Griffin, F. E. Muzzy, I. H. Page.
Lamson & Sessions Co., Cleveland, Ohio, H. C. Holt.
Stanley Works, New Britain, Conn., L. H. Pease, Geo. P. Hart, A. E. Duncan.
D. P. Hale, Sandersville, Ga.
Iron City Tool Works, Pittsburgh, Pa., Wm. H. Hays.
Fayette R. Plumb, Inc., Philadelphia, Pa., Fayette R. Plumb, W. R. Howell.
Ohio Tool Co., Auburn, N. Y., W. E. Jones.
Menard Mfg. Co., Eureka Digger Co., New Orleans, La., E. H. Brittan.
American Wringer Co., New York, G. H. Jantz, Geo. Reuter, Jr.
King & Thornton, Atlanta, Ga., Chas. P. King.
H. C. Kelley & Co., New York, H. C. Kelley.

Peters Cartridge Co., Cincinnati, Ohio, T. H. Keller, Maurice Kaufmann, F. C. Tuttle.
Hopkins & Allen Co., Norwich, Conn., F. M. Tobin, Chas. B. Lee, E. E. Perry.
Oliver Iron & Steel Co., Pittsburgh, Pa., Hy. W. Oliver, Jas. B. Oliver, Geo. T. Oliver, H. B. Lupton.
Standard Horse Nail Co., New Brighton, Pa., F. S. Merrick.
Ferro-Steel Co., Cleveland, Ohio, A. E. Menke.
Beers & Mitchell, Atlanta, Ga., Guy Mitchell.
Mayer & Co., Philadelphia, Pa., Harry Mayer.
McKinney Mfg. Co., Allegheny, Pa., W. S. McKinney, C. M. King.
North & Judd Mfg. Co., New Britain, Conn., Mr. Nobles, W. J. Peterson.
National Enameling & Stamping Co., St. Louis, Mo., T. K. Neidringhaus, Geo. H. Neidringhaus, Jno. J. Mapp.
Louisville Shovel Co., Louisville, Ky., Frk. Ouerbacker.
O. K. Stove & Range Co., Louisville, Ky., J. P. Ouerbacker.
Old Dominion Iron & Nail Co., Richmond, Va., Gifford V. Lewis, W. J. Orr.
Eagle Lock Co., Terryville, Conn., R. H. Plumb, C. W. Plumb, H. B. Plumb.
Chas. Parker Co., Meriden, Conn., W. F. Parker, L. C. Parker, Frank Pease, J. H. Hinsdale, W. H. Lyon.
B. F. Avery & Sons, Louisville, Ky., E. E. Paine, Wm. Black.
Hamilton Rifle Co., Plymouth, Mich., W. B. Penfield.
Columbian Stamping & Enameling Co., Terre Haute, Ind., W. H. Pipp.
Stanley Rule & Level Co., New Britain, Conn., R. M. Peck, J. P. Powell, A. W. Stanley.
Pike Mfg. Co., Pike Station, N. H., E. B. Pike, E. Warren Smith.
Wilcox Mfg. Co., Aurora, Ill., D. W. Simpson.

COL. B. F. ESHLEMAN.

Towers & Sullivan Mfg. Co., Rome, Ga., A. R. Sullivan.
O. P. Schriver & Co., Cincinnati, Ohio, O. P. Schriver.
Wm. Scholhorn & Co., New Haven, Conn., F. J. Scholhorn.
American Screw Co., Providence, R. I., H. A. Taylor.
Boston & Lockport Block Co., Boston, Mass., M. H. Tarbox, Alfred B. Tarbox.
Peck, Stow & Wilcox Co., Cleveland, Ohio, A. R. Treadway, T. H. Gossett.
Wagner & Marshall, Chicago, A. W. Wagner.
H. C. Whitcher, Detroit, Mich., H. C. Whitcher.
J. D. Warren Mfg. Co., Chicago, J. D. Warren, H. I. Cleveland.
The Bronson-Walton Co., Cleveland, Ohio, A. E. Bronson.
Belfont Iron Works, Ironton, Ohio, B. H. Burr, S. G. Gilfillan, J. R. Gilfillan.
Hart & Cooley Mfg. Co., New Britain, Conn., Norman P. Cooley.
Hero Fruit Jar Co., Philadelphia, Pa., Jno. L. Chapman.
Henry Disston & Sons, Philadelphia, Pa., Samuel Disston.
Meriden Cutlery Co., Meriden, Conn., C. F. Forsyth.
Troy Nickel Works, Albany, N. Y., J. E. Gaitley.
Goodell Co., Antrim, N. H., R. C. Goodell, D. H. Goodell.
The A. J. Phillips Co., Fenton, Mich., W. B. Phillips.
The International Cutlery Co., Clyde, Ohio, J. T. Rader.
Nixdorff-Krein Mfg. Co., St. Louis, Mo., H. Rashcoe.
Chicago Flexible Shaft Co., Chicago, A. W. Wagner.
Cleveland Stone Co., Cleveland, Ohio, H. W. Caldwell.
Stowell Mfg. & Foundry Co., Milwaukee, Wis., Jno. T. Rountree.
S. R. Slaymaker, Lancaster, Pa., S. R. Slaymaker, H. J. Benson.
Hussey-Binns Shovel Co., Pittsburgh, Pa., Geo. V. Willson.
Lovell Mfg. Co., Erie, Pa., A. W. Walker, Chas. S. Meacham.
Jenkins Bros., New York, A. C. Langston.
F. D. Mitchell, secretary-treasurer American Hardware Manufacturers' Association, Pittsburgh, Pa.
Wabash Screen Door Co., Chicago, Ill., E. M. Kemp.
Lufkin Rule Co., Saginaw, Mich., S. B. McGee.
McCaffrey File Co., Philadelphia, Pa., Edw. V. McCaffrey.
H. B. Black & Co., Chester, Pa., H. B. Black.
North Bros. Mfg. Co., Philadelphia, Pa., R. H. North.
Youngstown Iron & Steel Co., Youngstown, Ohio, Jno. O. Pew.
Corbin Cabinet Lock Co., New Britain, Conn., Geo. W. Corbin, Geo. L. Corbin, C. H. Baldwin, D. O. Macquarrie, W. C. Stevens.
Hardware, New York, A. E. Bolles, A. P. Mitchell.
American Artisan, Chicago, D. Stern.
The Iron Age, New York and Chicago, R. R. Williams, H. H. Roberts.

CONVENTION NOTES.

The visitor to New Orleans is told by the resident of that city that a visit to the Crescent City is incomplete without a breakfast at Madame Begue's. Upon the invitation of Palmer W. Holmes, manager of Lalance & Grosjean Mfg. Co.'s Chicago house, a party of gentlemen sat down to breakfast at this restaurant on Friday, November 21st, at 11 o'clock. The following gentlemen were in the party: Gus. Baldwin, W. M. Pilkin and C. D. Augustine, of A. Baldwin & Co., Limited, New Orleans; W. H. Bennett, Manager Reading Hardware Company, Chicago; D. W. Simpson, President Wilcox Mfg. Company, Aurora, Ill.; E. M. Kemp, President Wabash Screen Door Company, Chicago; Geo. Tritch, Geo. Tritch Hardware Company, Denver, Col.; Ed. Ingalls, Secretary Atha Tool Company, Newark, N. J.; John Rountree, Stowell Mfg. & Foundry Company, South Milwaukee, Wis. D. A. Merriman, American Steel & Wire Company, Chicago; C. A. Knapp, Knapp & Spencer Hardware Company, Sioux City, Iowa. Geo. Boole, Schwabacher Hardware Co., Seattle, Wash., and H. H. Roberts, Manager *The Iron Age*, Chicago. Addresses were made by the following: Geo. Boole ,Geo. Tritch, D. A. Merriman, Gus. Baldwin, W. M. Pilkin, C. D. Augustine, D. W. Simpson, W. H. Bennett and H. H. Roberts.

At the close of the opening session of the two conventions there was a special meeting of the large delegation which came on the special train from Chicago, in charge of W. H. Bennett, Chicago representative of the Reading Hardware Company, and H. H. Roberts, Chicago Manager of *The Iron Age*, who were in charge of the party. In recognition of their services and the efficient and courteous manner in which the whole thing was managed, A. J. Lee of Omaha, on behalf of the party, presented Messrs. Bennett and Roberts, each with a handsome sterling silver salad dish.

One of the pleasing innovations of the convention was a dinner tendered to a large number of jobbers and manufacturers at Lamothe's restaurant, by the Reading Hardware Company, of Reading, Pa. The company was represented by the following gentlemen: J. E. Harbster, G. N. Jacoby, W. H. Bennett, F. E. Stellwagen, T. B. Hendrickson, Chas. Packard and Fred. Magee. The party gathered in the rotunda of the St. Charles Hotel, and under the guidance of Mr. Bennett were escorted to the restaurant, where they found prepared a beautifully decorated table, flowers and fruits being spread in abundance. W. H. Bennett presided as toastmaster. The following, among others, were guests at the banquet: P. W. Holmes, Lalance & Grosjean Manufacturing Company, Chicago; W. A. Campbell, Wadsworth-Howland Company, Chicago, Ill.; A. W. Wagner, Wagner & Marshall, Chicago; D. W. Simpson, Wilcox Manufacturing Company, Aurora, Ill.; T. J. Usher, Russell & Erwin Manufacturing Company, New York; T. H. Bedell, National Sweeper Company, Marion, Ind.; Griffith Palmer, Weaver, Palmer & Richmond, Rochester, N. Y.; A. H. Crews, Armstrong Hardware Company, Oklahoma City, Okla.; James H. Boucher, Matthews & Boucher, Rochester, N. Y.; H. H. Roberts, Manager *The Iron Age*, Chicago; George Tritch, Geo. Tritch Hardware Company, Denver, Col.; Rudolph Tenk, Tenk Hardware Company, Quincy, Ill.; C. M. Wells, Morehouse & Wells Company, Decatur, Ill.; C. A. Knapp, Knapp & Spencer Hardware Company, Sioux City, Iowa; W. H. Harwi, A. J. Harwi Hardware Company, Atchison, Kan.; J. B. Silliman, Blish, Mize & Silliman Hardware Company, Atchison, Kan.; P. H. Philbrick, Foster, Stevens & Co., Grand Rapids, Mich.; Houston Wyeth, Wyeth Hardware and Manufacturing Company, St. Joseph, Mo.; A. J. Warner, Wyeth Hard-

ware and Manufacturing Company, St. Joseph, Mo.; Geo. Garland, Townley Metal and Hardware Company, Kansas City, Mo.; James Maroney, Maroney Hardware Company, Dallas, Texas; J. C. Kroner, Frederick Kroner Hardware Company, La Crosse, Wis.; W. M. Pitkin, A. Baldwin & Co., city; C. D. Augustine, A. Baldwin & Co., city. There were also a number of guests residents of New Orleans.

THE BANQUET.

On Friday evening an elaborate banquet was given by the American Hardware Manufacturers' Association to the members of the National Hardware Association, the visiting ladies and their guests.

The size of the gathering was such as to require the large dining room of the hotel, which had not been used for a similar purpose since the memorable banquet to President McKinley. Nearly 400 guests, including a good proportion of ladies, sat down at the table with the following *menu:*

MENU:

Sazerac cocktail.
Bayou Cook oysters on half shell.
Sauternes.
Celery. Salted almonds. Olives.
Consomme de Volaille, en tasse.
Broiled Spanish mackerel, sauce verte.
Pommes Parisienne.
St. Julien.
Diamond back terrapin, à la Maryland.
Imperial punch.
Cigarettes.
Broiled bluewing teal, Cresson.
Roederer brut.
Lettuce and tomato mayonnaise.
Neapolitan ice cream.
Assorted cakes. Bon bons.
Toasted crackers. Cheese.
Apollinaris.
Coffee.
Cigars.

Fayette R. Plumb, president of the Manufacturers' Association, presided, and at the conclusion of the dinner introduced Henry B. Lupton of Pittsburgh, as toastmaster. Very interesting addresses were made by R. A. Kirk, F. R. Plumb, A. Baldwin, George T. Oliver, Charles

H. B. LUPTON.

Janvier, T. J. Fernley and Irby Bennett. The pressure of our space will permit only a brief reference to the entertaining and instructive speeches, which were listened to with much appreciation and pleasure. When Mr. Lupton assumed the duties of toastmaster he said:

Toastmaster Lupton's Remarks.

It has been my pleasure, ladies and gentlemen, to attend most of the conventions of the National Hardware Association. Philadelphia extended a most delightful welcome. Modesty provents me saying how the association was welcomed at Pittsburgh. Cleveland and Milwaukee have entertained us, but there was something in the welcome received here that could only be given by this most beautiful and quaint old city of New Orleans. To you, our hosts of the past few days, we thank you from the bottom of our hearts. We cannot repay you in kind, but we will carry with us always most delightful recollections of what to many of us was our first visit to the Sunny South. It is with the greatest pleasure that we welcome to-night the oldest Hardwareman in the United States. In 1829 Isaac H. Stauffer came to Pennsylvania, and a few years later went to New Orleans, and for more than 60 years has been actively engaged in the Hardware business of this city. I will ask that we all rise and drink to the health of our distinguished guest."

An ovation was then given to Mr. Stauffer, the guests rising and drinking to his health.

An exceptionally witty and interesting address was

IRBY BENNETT.

then made by Albert Baldwin, which was full of interesting reminiscences.

The last speaker was Irby Bennett of the Winchester Repeating Arms Company of New Haven, who said:

Irby Bennett's Address.

Your proverbial generosity is again exemplified in the fact that you have permitted me to choose my theme for this occasion. There may have been method in your generosity, for I am not noted or famed for my constancy, except in matters of business and affairs of love, and to confine me to any subject would be an injustice of which you are incapable.

The important position our country holds among the nations of the world is impressed upon me by this gathering of business men. A more notable and representative body of a nation's commercial bone and sinew was probably never assembled, and certainly no fairer faces than you gracious women possess were ever seen about a banquet board. If I lacked inspiration, ladies, I could draw an all-sufficient amount from your bright eyes and smiling countenances, but my time is limited and I cannot tell the half I would say of "Our Country." It was formerly a custom of the American people to speak of our country as being divided, but, thank God, the line of demarcation between the North and South has been completely obliterated, and though it cost us dearly in lives, the sacrifice was a blessing to you and me, and our children will reap the advantage of living in a day and time when our people are united in the indissoluble ties of brotherhood, knowing but one enemy, the enemy of our flag, our united America. As a son of Southern soil, I claim the privilege of referring particularly to our South land, but, please you, only as it is marked geographically.

Since the day when Gallant Lee surrended his sword to Generous Grant the South has been making new history. She buried in her memory the past, and took up a commercial battle that she has waged successfully and with honor to herself and credit to the nation. In the last decade or two her progress has been phenom-

enal, and development of her agricultural, railroad and industrial interests has been as great as that of the country at large, and with proper encouragement and protection she will shortly be able to dictate the price of our great staple, cotton, to the markets of the world.

Our country has recently taken its position as the head of the world's nations, but to accomplish this it was necessary to wage a war that, though regrettable, was most glorious in its results. In this war sons of the South took prominent part, and we take a pardonable pride in their achievements.

When the loved and lamented President McKinley made his call for volunteers the patriotic South sent the flower of its young men to die, if need be, in defense of our principles, our teachings and our flag, and without fear of contradiction I assert that wherever our flag flies you will find the heart of the South.

I cannot close without special reference to this city. Claude Melnot said, in his love making to Pauline, that he would lead her to a clime where the year knows no change, save from balmy spring to glorious summer; where frost never came and where the rose that dropped from its stem, scorched and withered, at noon day, is replaced ere morning by another, sweeter and lovelier to behold, that the honeyed dews of night had nourished into life. Is it unnatural that we should suspect Melnot had this very spot in mind when he spoke so beautifully and feelingly? Certainly we have seen here all he describes, and your hospitality has won us.

New Orleans, we are proud to do you homage.

ADDRESS OF WELCOME TO THE A. H. M. A.

BY M. J. SANDERS, PRESIDENT NEW ORLEANS PROGRESSIVE UNION.

It gives me very great pleasure to have this opportunity of publicly expressing the welcome which this city of historical and romantic memories heartily tenders to the representatives of some of the most practical and up-to-date industries in this United States.

We are greatly pleased that you have chosen our realm for your first annual meeting place, and would suggest that you make this your permanent annual place of reunion, so as to insure to your association a permanent welcome of true Southern character.

When I think of what the American Hardware Manufacturers represent in the industry and progress of the world, I feel the utter inadequacy of any language I can use or that can be expressed in a brief address of welcome.

THIRTY YEARS AGO.

Memory carries me back to the days of my boyhood, alas, nearly thirty years ago, when as an English boy, with wide open eyes, I stared at the wonderful Hardware novelties, tools and machines then being introduced, by means of what were styled "American Novelty Stores," to the astonished and hesitant consideration of the British public.

I remember distinctly how these very novelties and their many peculiar and unmistakable advantages over those previously in use caused a shock of surprise to the mass of the British people, that America had advanced sufficiently to make such things, which it had to be admitted were in some cases better than British make, though, of course, they were not so heavy and strong, and, therefore, would not last.

I believe these very Hardware Novelty Stores were largely responsible for the conclusion reached by the British public that, though the Yankees were certainly smart, their principal ability turned to the invention and manufacture of hardware novelties, quite clever and interesting, but of really small moment after all.

It was some years afterward that not only Great Britain, but the whole of Europe, began to realize something of the resistless potentiality of the American tools and machines. Carlyle's definition of Man as a tool-using animal is neither complete nor satisfactory, but it undoubtedly contains a world of truth.

It is certainly a fact that the race of men using the best tools will be distinctly in the lead, and there can be little doubt but that in this respect the United States is now well to the front. Not only do we invent and make new tools and machines, but we have certainly up to now appreciated more readily their economical value, and have much more quickly than other people relegated the inferior tools to the scrap heap.

IN THIS READINESS TO ADOPT IMPROVED METHODS

lies one of the very greatest factors in the extraordinary development of our various manufactures and our ability to compete successfully in markets controlled for generations past by other nations. I take it that this Association represents, perhaps more than any other, those great industries who have manufactured these improved machines and tools, and have thus rendered such matchless service to the commerce of our country.

The introduction of labor-saving machinery has, however, been the direct cause of much fear and conflict with the laboring classes. It is almost impossible for the mass of laborers to see how they are to be benefitted by being deprived of the means of a livelihood. They are but poor political economists, but they know the cost of food and clothing, the necessities of themselves and their children, and the ceaseless grind of hard labor to keep the wolf from the door.

LABORING CLASSES BENEFITED.

It has taken a generation of time to demonstrate that the poorer classes have been by far the greatest beneficiaries of the vast economies of modern machinery.

The most radical and wonderful improvements have often been but a nine days' wonder to the outsider, and only by comparing the varied conditions, past and present, can we at all realize the marvelous effect, the comprehensive and far-reaching influence, which improved machinery and tools have exerted upon the advancement and civilization of the human race.

The founding of this Association for the promotion of your mutual interests appears to be directly in the line of that commercial evolution which has been very evident for more than a generation, and which appears to have its logical, if not ultimate, goal in the merging of interests into enormous consolidations of the capital employed in similar commercial undertakings. The interests of your members are doubtless too diverse for any amalgamation, but there are numerous very important customs and abuses which you can, by means of this Association, modify and rectify to your mutual advantage.

COMPETITION.

It would seem that many commercial men generally have concluded that the old shibboleth that "Competition is the soul of business" has been worn threadbare, and that it is high time to seek some remedy for the frightful wastage and disorganizations resulting from unrestrained, unscientific and uneconomical competition.

Doubtless there is grave danger feared by many from the aggregation of such enormous wealth and power in the hands of a few individuals, but have we any right to be particularly satisfied with the results of the present system?

The great mass of humanity consists of what is generally called the poorer classes, the "wage earners." Is he not generally the first and heaviest sufferer under a keen and unrestrained competitive system?

It is surely a source of thorough dissatisfaction and sorrow to all thinking men that the mass of humanity is condemned to unremitting labor, from the cradle to the grave, for the sole object of maintaining life.

It is a fact that a large mass of humanity can at best keep body and soul together, has absolutely no opportunity of improving its mental and physical conditions and environment, and is doomed to an existence which to their more fortunate fellows is surely not worth living.

How can we expect any material improvement or civilizing of the masses under such conditions? Henry George ascribed this disgraceful condition to the private ownership of land, and whether he be right or no in

his earnest and forceful enunciation of a remedy, the baneful misery remains ever present and insistent, so that the thousands of benevolent workers the world over are overpowered with the apparent utter hopelessness of their unselfish labor.

So long as human nature remains unchanged there will remain self-seeking, and therefore, competition, but is it not conceivable that the merging of interests, with the probable decrease of senseless competition, may have a direct material influence upon the conditions of labor?

I am hopeful that the limit of senseless, selfish commercial competition has been reached, and that the near future may see the dawn of some system of co-operation, the beneficial results of which will not be confined to those who are already in comfortable circumstances, and who do have a horizon broader than the daily food supply, but which will include therein that suffering humanity which is struggling, often blindly, ignorantly, and foolishly, for the much needed betterment of its conditions.

UNDER OUR FORM OF GOVERNMENT

and the comparatively developed individuality of our citizenship, I fear no serious danger to our social fabric. The power of the franchise is, after all, supreme, but, being so, it imposes upon our legislators a supreme responsibility and the duty of supreme caution.

Mr. Chairman and Gentlemen, I fear you will consider that I have wandered far from my text of welcome, but it is hearty and sincere, because of a firm belief that such associations as yours tend in the ultimate to help forward the welfare and uplifting of our whole people.

This city, upon the banks of the Great River, after lying dormant for a generation, under the fearful aftermath of a civil war, horribly proportionate to the majesty of our nation, has now awakened, has put on its working clothes, and is determined to resume its ancient position and prestige in the commercial and political forefront amongst the great cities of our great country.

We welcome you heartily, as eminent examples of that earnest enterprise, marvelous fertility of resource, and tireless industry which has made this young nation a giant amongst the peoples of this world.

Though we have now joined the ranks of the workers, you can rely upon it that our welcome will lose nothing of its old-time Southern warmth and chivalry. We regard you as good comrades, walking with you now in the ranks of that Grand Army of Industry which shall conquer ignorance and misery and make this old world a veritable paradise.

RESPONSE TO ADDRESS OF WELCOME.

BY JULIUS C. BIRGE OF ST. LOUIS SHOVEL COMPANY, ST. LOUIS.

We are informed that the gentleman who has prepared the admirable address of welcome which has just been read, is a gentleman of distinguished ability and the president of one of the most important commercial organizations in the Southern States. At first there was a feeling of regret in my own mind that we could not have the benefit of the writer's personal presence and inspiration in the presentation of his own paper. This feeling, however, was soon dissipated as the result of the graceful and vigorous manner in which the paper has been presented by the secretary of the same organization.

The paper contains many valuable suggestions, either of which would be worthy the consideration of this body for an entire session. It is not my province, however, to consider these weighty matters, but it is simply in an informal manner to respond to the welcome which has been given this body of visiting manufacturers by the citizens of New Orleans.

It would be difficult to conceive of a welcome more generous and free, or one more gracefully expressed than that which has been extended to this body of manufacturers. Nevertheless I believe that even this very cordial greeting is no surprise whatever to any one of us who knows anything of the generous and noble hospitality of the men and women of the sunny South.

For the purpose of qualifying myself with a view to throw a side light upon this welcome, permit me to state for the greater part of my life my home has been near the geographical center of the country. It is not in the North, for we can reach the gulf in a day, passing through no State except where the cotton blooms. It is not in the South, for we can reach the great northern lakes on our Canadian frontier in a night. It is in the East as truly as it is in the West, and yet it is in neither. Through the great arteries of commercial life I believe we feel the pulse beat of the nation to its remotest bounds. It may therefore be proper in reply to this welcome for me to state to you, and from personal observation, that if you or any of your friends in the dear old South will go to the door of any one of these Yankee manufacturers or merchants of New England you will find that they too have big, warm hearts and would love to give you a welcome. I have found the same to be true on the Pacific Coast. The merchants from San Diego to Seattle would welcome you as brothers. We would be glad to welcome you all in St. Louis, and we expect to do so in 1904, at which time we hope to celebrate the acquisition of this magnificent Louisiana Territory.

A NEW SOUTH.

The time has passed, however, when a welcome to the manufacturers of America is simply a greeting to gentlemen from New York, New England and perhaps the Middle West. We have a new South. The fires of manufacturing industry have been lighted in these great Southern States, and here to-day we see the manufacturer representing vast industries in Alabama beside his brother from Pennsylvania. We also here see a manufacturer who, I understand, is wont to set his boiled lobster near where stood the old North Church in Boston, in whose steeple swung the lantern which signalled Paul Revere in his memorable ride to rouse the patriots to the defence of their liberty. The old churches of Boston which in the parliament of Great Britain were denounced as the seed bed of rebellion.

Here also is his honorable competitor, who may now and then worship in the old church in Richmond where Patrick Henry delivered his immortal speech on liberty and union, familiar to every school boy. Patrick Henry, the Virginian, who was broad enough in his day to say: "I am not a Virginian, I am an American."

As the nations of the earth have come to know, all Americans from Seattle to Florida Keys, although at peace with the world, now stand shoulder to shoulder in the arts of peace and in the arts of war. The gentleman has spoken of his observations on our exports to Great Britain. The manufacturers of America through its great ports like New Orleans are now shipping their wares not only to Great Britain, but to every port on the globe. The stamp "Made in the United States" has come to mean very much as to quality. Our locomotives and machinery have stood the test for excellence. It behooves manufacturers to maintain for their goods the high standard which they have established and under no circumstances to permit any deterioration in quality.

NEW ORLEANS.

The gentleman has spoken of this beautiful Crescent City—New Orleans. He has referred to the great river which passes your doors. He has referred with much clearness to the importance of merging interests. New Orleans is a city which is remarkably situated. It would seem as if many years ago nature had resorted to a merging of interests, entering into an alliance with New Orleans, giving to this city control of the grandest river highway on the face of the earth. Far up in the distant Northwest, thousands of miles away, waters are distilled on the mountain sides of Colorado, Idaho, and Montana, which, flowing through hundreds upon hundreds of tributaries, converging into the long, long channel of the Missouri at the mouth of that river, they mingle with the sparkling waters coming from a thousand lakes in the far North near the distant Canadian line. From the far-away Northeast, from the seaboard State of New York and the mountains of Pennsylvania and Virginia, other waters roll down the great Ohio by Pittsburg, Cincinnati, and Louisville, they mingle with

the waters of other navigable streams, either of which would be a feature of any other country, and all these in one vast flood come down this great father of waters. It is true that a score of States contribute more of their soil than is absolutely necessary for drinking purposes, but the commerce of the world could be floated upon the bosom of this great waterway. If half the sum which is expended in carving canals through hills and highlands should be judiciously applied to the improvement and preservation of this natural national highway, New Orleans would become in a higher degree than when the river was in its glory, one of the greatest ports on this continent. Open in the summer and open in the winter, when the rivers, lakes and canals of the North are locked in ice, the value of this great highway is not everywhere appreciated.

Many stories are told of dreams in which St. Peter was a prominent figure. One is told of a stranger who appeared at the Celestial gate. St. Peter asked him what he had ever done to commend him. The stranger replied, "I am a hero of the Johnstown flood." The words "Oh, rats," in a subdued and derisive voice came from the lips of an old man just within the gates, but the stranger was passed in. Soon another stranger came, to whom the same question was addressed. The stranger replied, "I am a hero of the Galveston flood." Again the words, "Oh, rats," came from the old man within, but the second stranger was passed through the gate. The two meeting within, exchanged remarks concerning their experience, which led them to return, whereupon they asked St. Peter, "Will you please inform us who is that old man who said "Oh, rats," to us. St. Peter replied, "Why, that is old Noah; he thinks that his flood is the only flood worth mentioning."

There are many good and wise men up in the Northeast who think that the Erie Canal, or perhaps the Penobscot River, are the only waterways worthy of consideration, but men of the South, those people up in that country make their waterways to respond to the highest demands which can be made upon them. The old ditch known as the Erie Canal bears a commerce which is too near that which is borne upon this mighty Mississippi, with its thousands of miles of navigable tributaries, reaching nearly across the continent, and draining one-half the total area of the United States.

I observe that the gentleman has made no reference to the women of New Orleans, who are contributing so much to the pleasure and comfort of their lady guests who are with us. These women need no mention. Some of our young men may have in mind with this reference the Maid of Orleans. Yes, we have all read of the Maid of Orleans, and of her devotion and sacrifice to the cause of old France. We also have read of the women of New Orleans, of New France, and the women of the entire South, and of their devotion to any cause, to any friends which may commend themselves to their affections.

The chief object of these gatherings, I believe, is to promote good fellowship, to stimulate honorable purposes and relations, to come into touch with friends, and to weave into the dull fabric of our strenuous business lives a few golden friends. It is doubtless with this thought in mind that the president and directors of the American Manufacturers' Association have requested me, in responding to this tender of the hospitality of your beautiful city, to thank you for the invitation which you extended to us to meet you here, for the friendly co-operation which we have received in preparing for this gathering, and for your greeting, and that its acceptance may bind still closer together the business and social life of our beloved country.

REPORT OF SECRETARY-TREASURER OF AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION.

Our third convention opens with a membership of 168 manufacturers; and while this may be considered a fair showing for our first year under organization, I feel that we should not rest upon our oars, content with the assurance that we have been successful along the modest lines suggested at our organization meeting, at Cleveland, but should find encouragement—enthusiasm even—to make our second year's progress equally gratifying.

If we have no objects in view beyond bringing together, twice a year, the same gentlemen who would attend these jobbers' conventions, in any event; and having our own program and badge; and feeling that we had risen above the title of "camp followers" at these conventions,—feeling that it could no longer be said that during the executive sessions of the jobbers' associations we "had nothing to do,—and did it badly,"—we might sit complacently and take in only those who knock at our doors, satisfied that it was well worth $10 apiece to be able to attend these conventions as a delegate, rather than an outsider.

But these are not our sole objects; whatever the motives which led to the inception of this organization, it very soon became evident that the field of its activity would broaden in proportion as the commercial responsibility of its membership increased, and the scope of its work be limited only by indifference regarding such growth.

ENLARGING THE SCOPE OF THE ASSOCIATION.

And in view of these facts, I believe that before we proceed to take up, in our executive sessions, questions touching the business relations of buyer and seller, with a view to effecting, through concerted action, an abatement of what we consider abuses grown up in our trade, and a reciprocal treatment of such just demands for changes from our present methods as may be presented to us as an organization by the Hardware Jobbers' Association, we should take up the question of what it is which gives any importance to such action as we may take at these meetings and ascertain the consensus of views as to whether we will continue our organization on the lines originally suggested, limiting its scope and efficiency by our present small membership; or whether, noting the significant growth of other and similar organizations, and their strenuous efforts made during the past year looking to still larger growth, we shall profit by the happy conception which has already laid for us a strong foundation, and use earnest individual efforts to build up an organization which shall represent such a community of interests, which make for our national prosperity, that our work shall not be limited to questions touching our relations with our good friends, the jobbers, but that associated action shall secure for our members a betterment of conditions in other matters of vital importance, which cannot be secured by individual action.

I feel a pardonable enthusiasm in the work of this Association, which can perhaps only be experienced by one handling its correspondence. Our Executive Committee gives considerable gratuitous time to careful consideration of many subjects, threshing out for discussion at these meetings only such matters as may be successfully acted upon by an association numerically small and but one year old. I say "successfully" advisedly, because many members have stated to me that, while our actions are binding upon no one, the knowledge that so many manufacturers were taking a definite position in the matters covered by our previous resolutions has resulted in saving their firms several hundreds of dollars.

MEMBERSHIP IN AN ASSOCIATION

which costs but the nominal sum of $10 per year, to defray its necessary clerical expenses; which makes no demands upon the time of its members other than an occasional Yes or No vote upon the expediency of any action suggested by its Executive Committee, and which makes for closer relations, not only between manufacturer and jobber, but between manufacturers engaged in competitive lines, bringing them together twice a year for the friendly discussion of business interests held in common, should appeal to every Hardware manufacturer in the United States as desirable; and I am firmly convinced that it needs but a little active co-operation by the members already enrolled, in explaining to their manufacturer friends who may be eligible our objects, what we have accomplished, and what we might accomplish were our membership doubled, to enlist their support, and achieve that position during the coming

year, and that the benefits to members through concerted action by the larger number would amply recompense for the slight individual exertion required to secure one new member. "Nothing succeeds like success."

Our association has grown beyond the hopes expressed at our first meeting; our first year closed with all expenses paid and a little cash balance carried over; we were well advertised compared with similar organizations; we have the best article on the market for the price, and I believe that in nine cases out of ten it can be placed with ten minutes' explanation. But it is an article which cannot be as successfully presented by Association correspondence as by personal interview or personal letter.

MUTUALITY OF INTERESTS BETWEEN MANUFACTURER AND JOBBER.

BY FRANK DICKERSON OF THE AMERICAN TIN PLATE COMPANY, NEW YORK.

It is always a pleasure to meet the members of the National Hardware Association, and especially is it the case on such an occasion as this, when the subject for discussion begins with the statement that there is a "mutuality of interests between the jobber and the manufacturer."

When I first saw this topic I was almost staggered by that long word, mutuality, but I felt that it was a true statement, that there was a mutuality of interests, and that it would not do for me to be suspected of an unwillingness to discuss such a topic. My position was somewhat like that of little Johnnie when he went to the cupboard to help himself to his mother's jam. Almost before he was aware of what he was doing the contents of the jam pot had been transferred to Johnnie's bread-basket, and he felt that there might be waiting for him, if not a touch of the slipper, at any rate a tongue-lashing that would be decidedly disagreeable. Therefore, Johnnie caught the family cat and, taking a spoon still covered with jam, he began to daub up poor pussy's face, remarking at the same time, "It is too bad to muss up your face this way, pussy, but I cannot afford to be suspected."

Now, as I understand the topic, the discussion is not as much about the mutuality of interests as it is how this mutuality of interests can be advanced, which might easily be answered by saying, "Attend the meetings of the National Hardware Association, and the mutuality of interests will surely and certainly be advanced." But I take it, gentlemen, that this is not the answer to the conundrum that you expect, but, inasmuch as you have put before me the conundrum, I should like, before giving an answer, to give you a conundrum, which is this: What is the difference between a honeycomb, a honeymoon, and a young lady? Those of you who are not already acquainted with the answer I will not leave in doubt, but will tell you that the honeycomb is a small cell; the honeymoon a large sell, and the young lady a damsel.

In all seriousness, our mutuality of interests may be advanced in several ways, but it is rather the principle by which they may be advanced than the details that I wish to mention at this time.

First—I would say to both jobber and manufacturer, "Bury your prejudices." All of us are more or less prejudiced, and naturally we are prejudiced in our own favor. But laying aside all prejudices, let the jobber and the manufacturer meet in friendly council and in a friendly spirit and the interests of both will be certainly enhanced.

Second—Let us trust one another. Let that trust be in regard to honesty, fairness and integrity. Let us believe the other man to be in these respects just as pure and straightforward as we are, and sometimes some of us may be surprised to find that the other man is even more fair and just than we had regarded him as being. Let us treat one another as the law treats us, believing every man guiltless of a wrong-doing until the facts of that wrong-doing are clearly proven.

Third—The wisest of all men, Solomon, is said to have written, nearly three thousand years ago, these words, which we find in the Book of Proverbs: "A man to have friends must show himself friendly," and it is as true to-day as it was then that he who would have friends must exercise a friendly spirit. These conventions of the National Hardware Association have done much toward the advancement of a friendly spirit between the jobber and the manufacturer, and now that the manufacturers are themselves organized to meet with you jobbers, that spirit of friendliness will naturally grow. But it would be useless for either of us to be friendly at the time of the convention and then be unfriendly when we met at other times during the year. My opinion is, rather, that whether we met or not, let our actions be such as will show a friendly spirit throughout, and in this way I am convinced that our mutuality of interests will be advanced.

CO-OPERATION.

There are other things which might be mentioned that will tend to advance that mutuality of interests which certainly exists between the jobber and the manufacturer, but I will not take up your time to speak of them, especially as other speakers will probably refer to them in their remarks. But, before closing, permit me to refer to just one thing more, namely, the spirit of co-operation which should exist, and which to some extent does exist, between the jobber and the manufacturer. Perhaps the chief and most noteworthy characteristic of our people is their independence, and we have shown that to the world more than once in political affairs. But remember, gentlemen, that we did not win our political independence until the spirit of co-operation was so thoroughly brought home to us that the then colony of Virginia was willing to meet the forces of the colony of Massachusetts and, under the leadership of George Washington, shut up the British army in old Boston town. We love our independence, and if need be will arm ourselves again to defend it from all comers, but we are learning slowly that this spirit of independence should not be carried to such an extent as to prevent co-operation. There was a time when the interests of the North and South were so divergent that co-operation seemed impossible, but the Spanish war proved conclusively that loyalty and patriotism were stronger even than the love of individual independence, and the whole country gathered together to defend the nation's honor. The interests of the jobber and the manufacturer are not identical, and probably never will be, but we have learned that there is a mutuality between them, which encourages the hope that, through co-operation, that mutuality may be advanced.

Let us then bury our prejudices, trust one another, and, meeting in a friendly spirit, co-operate one with another to do that which shall prove for the best interests of all.

MUTUALITY OF INTEREST BETWEEN MANUFACTURER AND JOBBER.

BY W. H. COWDERY OF THE AMERICAN FORK & HOE COMPANY, CLEVELAND, OHIO.

Your secretary suggested that I say something about the relation of our company with the would-be jobber. I want to tell you that we realize our dependence upon the jobbers to distribute our products, and much more so because the character of our goods is what you call "seasonable;" they must be distributed over the country within a few months of the year. Therefore we are dependent upon the jobbers. We need your capital, we need your experience, because you have gathered about you very many of the best salesmen of the country. We need also your good will. How can we gain this? You need our products. Let us work together. How can we do our part toward furthering your interests? We think we can do it by organization of a number of factories and by making more uniform prices from season to season. You all realize how the prices vary from one year to another, sometimes up and sometimes down.

We think we can do you a good service in our organization by giving better attention to orders, by giving better deliveries. We ask you not to expect too much this coming season, however. There is confronting us one of the greatest difficulties and that is the supply of good ash timber for handles for our Tools. We realize

we must seek this in more distant fields. We think by being organized we can do this to better advantage without advancing prices, which we would have to do if we did it singly.

EXPORT TRADE.

BY FRANK L. CLARK, PRESIDENT ALABAMA TUBE & IRON COMPANY, BIRMINGHAM, ALA.

It seems fitting that in the city standing second as an exporting center of these United States some reference should be made at this meeting to export trade. The exports in which this section is interested are agricultural, while I wish to direct attention especially to our exports of manufactures. It is but a few years since the eyes of our manufacturers generally were turned to the markets of the world, and I believe that up to the present time we have but scratched the surface. But few of the members of this association who have not had experience in exporting, so that it is not necessary to point out the advantages of such trade. You are well aware of the fact that foreign markets absorb our surplus products, insuring more stable prices at home, and that they keep our labor more fully employed. With labor engaged at even moderate wages, prosperity in this country must be assured. With these advantages before us, it is but natural to inquire

HOW WE MAY EXTEND THIS EXPORT TRADE.

While I do not wish to detract from the good work performed in this line by our export houses, it is not reasonable to suppose that for their ordinary commissions they can properly advertise and push American manufactures. The manufacturer himself should aim to send into every foreign market travelers who are familiar with the language and customs of the people. Against this plan will be urged the expense of such procedure; but I would meet this by suggesting that manufacturers in the same line should join hands and seek this trade together.

Another means of securing the ends desired is the establishment of resident agents who will push the sale of American goods. We can also foster export trade by studying the wants of different markets and adapting our manufactures to such conditions.

A MATTER OF VITAL IMPORTANCE.

When orders have been secured, it is of vital importance that the greatest care should be used in their execution. Foreign buyers should be given the exact grade of goods represented by samples, no better and no worse. They should be packed substantially and in the manner customary in the country to which they are to be consigned. It is a lamentable fact that the cotton exported from the United States is not so well baled as that from Egypt and India, entailing upon the foreign buyer loss of cotton and higher rates of insurance. Faulty packing of cotton will be tolerated by other countries, as they are forced to depend upon us largely for their supply, but the same laxness in shipping our manufactured goods will result ruinously to us.

THE CUSTOMS REGULATIONS OF EACH COUNTRY

should be well understood by the American manufacturer before engaging in foreign trade. In corresponding with a foreign buyer it should be considered common courtesy to address him in the language of his own country. It would seem to be a forward step if our educational institutions would teach the youths of the land the languages used in the world's commerce, instead of giving them so much Latin and Greek. Prices should be quoted to foreign merchants c.i.f. receiving ports, and in the money familiar to the buyer. Our manufacturers seem disposed to frequently name prices f. o. b. American ports, in dollars and cents, and it is needless to say that slack attention is given such quotations.

SYSTEM AND PERSISTENCY.

Our efforts in the direction of the export trade should be systematic and persistent. Many of our manufacturers seem to possess the idea that foreign markets can be used as a dumping ground, but it is my experience that this is not the case. It is difficult to induce the world's buyers to change their sources of supply, but when we have once gained their trade and good will it is not difficult to maintain our position, if we will but give them reasonable prices, good goods and fair treatment. Our exports of iron and steel and the manufactures thereof were less in 1902 than in the preceding year by $19,000,000, though exports in all other lines of manufacture were the same, or greater. In the case of cotton goods, the increase of 1902 over 1901 was $11,000,000. This would seem an opportune time for the manufacturers of iron and steel to take steps to regain this lost ground. This export trade will be needed at some future date, and the manufacturer who will anticipate that time will be well repaid for his foresight.

TRADE-MARKS OR PRIVATE BRANDS.

BY FRANK DICKERSON, AMERICAN TIN PLATE COMPANY, NEW YORK.

Since choosing the topic of private brands, I have learned you discussed this subject last summer, and I regret to have made this mistake in selecting a topic. Doubtless you remember the old question, "Which do you prefer? To be a greater fool than you look, or to look a greater fool than you are?" Whichever horn of the dilemma is chosen, the answer is, "You couldn't." Similarly, whether I stick to my subject or change to another, but I'll choose to stick.

NO UNIFORMITY IN PRACTICE.

In regard to furnishing a private brand or trade-mark to the jobber, there seems to be no uniformity on the part of the manufacturer. There are manufacturers who decline to give any private mark, the goods must be bought under the manufacturer's brands. Others will give the jobber his private brand only when the mark of the manufacturer is also upon the goods. Again the privilege of a private brand is given only under certain conditions imposed by the manufacturers. Others give the jobber any mark he desires without any restriction, except that he pay the price. And it has been asserted that occasionally a manufacturer will give to the jobber his private brand at a lower price than that which the manufacturer obtains for his own brand. If this be so, gentlemen, that manufacturer may be described by the words I just now applied to myself.

Among the jobbers there is an equal divergence of action and method. Some have one brand which is put on all goods they handle; others have a private brand for each distinct class of goods, and yet others for each separate quality. The more usual custom is, I believe, a separate brand for each article. Some jobbers have two or three brands for the same thing, and that article, the same in every particular and quality, will be sold to the Irishman as "Erin go bragh," to the German as "Hoch der Kaiser," while the native buys it as "E pluribus Unum." A comparatively small number of jobbers ask no private brand, and sell only under the trade-mark of the manufacturer.

THE OBJECT OF THE PRIVATE BRAND

is that the jobber may obtain an extra profit and that his competitor may not know the quality of the goods sold, even if he learn the price. To this end, the jobber's customer is not enlightened by the private brand as to the real quality of the article furnished. While there may be no intention to deceive his customer in this respect, yet it reminds me of the Wall Street broker, a bit of a wag, who went into his friend's office, a Hardware man. He took half a dozen new silver quarters from his pocket, and announced that he had just bought them for twelve and thirteen cents apiece. The Hardware man examined them very carefully and said, "Where did you get them? Can I buy them, too?" The broker told him the place, and Mr. Hardware fell into the trap, and said he would "take 2,000 just as curiosities." When, however, his clerk returned with the news that the cost would be $500, he saw that twelve and thirteen cents make exactly twenty-five cents, and concluded that he did not need so many curiosities.

THE WORST FEATURE.

There are many objectionable features to such lack of uniformity in regard to trade-marks and private brands, but the worst, it seems to me, is that perhaps a dozen different manufacturers will supply the same private brand to the same jobber, and in no single case will the

quality be exactly the same. Frequently, also, different jobbers will use the same brand for entirely different qualities, of the same goods; and thus chaos reigns in this field of trade-marks.

A brand, whether the manufacturer's or the jobber's, should have a distinct value, and very probably this is so in the vast majority of cases. By advertising and use, the brand becomes well known and is representative of quality, which, in the interest of the public, should not be disturbed. In the establishment of the monetary value of a private brand or trade-mark, the manufacturer contributes his share in producing a satisfactory quality, the jobber introduces that quality under his own private mark to the public. Therefore, there is an equality of interest in the establishment and maintainance of the standard of quality represented by the private brand. The manufacturer and the jobber should jointly own the private brand, or, if the one be considered the owner, the other is the tenant in possession, and the lease, if we can apply the term to the private brand, should be a long one for a series of years.

IF WE HAD JOINT OWNERSHIP OF PRIVATE TRADE-MARKS,

or long leases of not less than ten years, all the objectionable features of the present system would be abolished. All right-minded men desire that which is fair and just; the present system is often unjust and unfair, not only to the manufacturer, but also to the public. Then let us relegate to the past the present system, or, rather, lack of system, and adopt in its place that which will be fair and just to all the world.

TRADE ITEMS.

THE UNION FIRE ARMS COMPANY, Toledo, Ohio, have been organized with a capital of $150,000, to take over the business and plant of the Colton Mfg. Company of that city. The officers of the new concern are as follows: Geo. B. Colton, president and treasurer; John H. Housholder, secretary, and A. T. Elvin, superintendent. The company will put on the market a new six-shot magazine Shotgun and also a double barrel hammerless Gun with automatic ejector. They have purchased new equipment throughout and expect to be in their new building by December 15. The new Guns will be ready for the market by February 1, 1903.

BROWN & DOWD MFG. COMPANY, Meriden, Conn., manufacturers of Hardware Specialties, have moved to their new quarters in the Schenck Building on Centre street, where they have a much greater amount of space than they had in their former factory.

C. N. FROST AND W. J. FROST, formerly president and secretary respectively of the Badger Brass Mfg. Company, Kenosha, Wis., have taken up a new line of manufacture. They have organized the Frost Mfg. Company, who will manufacture a line of Plumbing Supplies at Kenosha. The Badger Brass Mfg. Company will continue, without change in style, the manufacture of Solar Bicycle, Carriage and Automobile Lamps on a large scale, the outlook for the coming season being excellent, especially in the Automobile Lamp line.

WE are in receipt of a copy of the second annual report of the General Manifold Company, manufacturers of Carboned Papers, Franklin, Pa., with branch offices in the principal cities of the country. Chas. B. Holdrege, who has been general manager of this company since January 1 last, is well known to the trade in view of his former connection with Hibbard, Spencer, Bartlett & Co., Chicago, as manager of their Railway Supply department.

THE UNION METALLIC CARTRIDGE COMPANY, Bridgeport, Conn., report increasing sales of U. M. C. Arrow and Nitro Club Shot Shells loaded with any of the Standard smokeless powders. A recent extensive enlargement of their plant puts them in a position to fill all orders promptly. The company will be pleased to furnish advertising matter on request, including the folders and stickers advertising U. M. C. Shot Shells, which may be used on envelopes, packages, &c.

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NOTES ON FOREIGN TRADE.

BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE, NORFOLK ST., LONDON, W. C., Nov. 15, 1902.

The Week's Hardware Trade.

THE Hardware market during these later days is very wabbly. If a few good orders come in the chances are that the prices are unremunerative but as a matter of fact orders are hard to seek, for trade is on the decline. Orders that now come in on home account are small and diverse, with the result that manufacturers are nonplussed as to production. They are chary of making in large quantities, while to make in small quantities is uneconomical. It is clear to me that before long there will have to be a considerable rearrangement of prices throughout the whole Hardware trade. The most healthy department at the present moment would seem to be Cast Hollow Ware in copper, brass and iron. Makers of Chandeliers and Gas Fittings are also busy, as are Tube drawers, both in copper and brass.

On over seas account the best orders are coming from South Africa, Canada and the United States. Orders from Mexico have improved, while there is some improvement with Brazil and Uruguay, but taking South America as a whole expectation is disappointed, for much was expected from the recently reported improvement in the financial condition of Argentina. Better trade reports come from Northern India and China, but Hong Kong seems to lag. I suspect that the Hong Kong dealers are distributing their orders now over America and Germany as well as Great Britain, which accounts for the apparent slackening of the Hong Kong demand. Western Australia is sending good orders for Pumping and Mining Machinery, Pipes, Railway Material, Fencing Wire, Tools and Galvanized Iron. Most of the European markets continue flat, particularly Germany and France. Belgium is just now buying a fair quantity of material from Birmingham and Wolverhampton, and there has been a marked expansion of trade with the Balkan States, especially Roumania. Financial difficulties in Turkey are leading to serious contraction of trade with that country. Orders from Egypt show a reduction, but it is confidently anticipated that with the opening up of the Soudan a large trade with that district will very soon become a regular feature. In regard to trade in Belgium and Holland, I extract herewith comments by a traveler who has just returned from those two countries:

There is, it has been found, a great deal to be done by our travelers if they will only offer the goods that are in demand in those countries. In general Hardware there is a big trade to be done, especially with Holland; but at present it is mostly in the hands of Germans. With regard to Cutlery, there is more to be done in Holland than in Belgium, the duty in the former being only a general one of 5 per cent., wheras in Belgium, it varies from 12 to 20 per cent. This trade again is nearly all done at present by Germans. In Holland a Black Handled Knife of scimitar shape is extensively used, as are also White Metal Forks and Spoons of the fiddle and old English patterns. A very considerable proportion of these are of Birmingham make, which for finish and cheapness are described as far in front of Sheffield productions. Birmingham firms are also ahead with Teapots, Cruets and other Hollow Ware goods. Their success in cheap production is owing, it is stated, to the fact that they employ a great deal of girl labor and use machinery freely, and so produce at a minimum of cost. Sheffield, however, more than holds its own in Sterling Silver and best electro plate and Britannia Metal Wares. When a high class of goods, alike durable and artistic, is needed, distributors have no hesitation in placing their favors with Sheffield houses.

Exports in October.

During the month of October the exports of metals and articles manufactured therefrom advanced by £577,392, as compared with October, 1901. October has, indeed, been a good month in the export trade, just as it was a poor month for the home trade. The sales of Cutlery during the month, however, fell from £60,000 to £57,000. Notable in this connection was shrinkage of Australian purchases of Cutlery. The United States purchased £7277 worth of Cutlery, as compared with £6225 worth in October, 1901. The South African purchases of Cutlery advanced from £9175 to £11,103. Two other notable increases in the Cutlery trade were those of Germany, rising from £1034 to £1990, and Brazil rising from £1720 to £4156. On the other hand, Cutlery exports to Chile fell from £1985 to £988, while Argentina purchases shrank from £1731 to £446. India took £2000 worth less of Cutlery. In general unenumerated Hardware there was an advance in the export trade from £129,727 to £135,430. This advance is entirely accounted for by the sales to South Africa, which rose from £14,184 in October, 1901, to £23,651 last month. There was a shrinkage of the Hardware trade with Sweden, Norway, Germany, Spain, the United States, the West Indies, Chile and Argentina, but substantial increases are recorded with Russia, Holland, Brazil, India, in addition to South Africa, already noted.

Recent American Shipments to Great Britain.

I send you a detailed statement of American Hardware and metal shipments to this country over a period of 11 days, from October 20 to November 1. The particulars herein stated indicate clearly enough what is the nature of the autumn shipments to this country. American firms who see mention of any shipments of goods in which they are interested, and who themselves do not do this business, can communicate with me through *The Iron Age*, and I shall be glad to inform them of the names of firms in this country who buy the goods mentioned:

October 20.
HULL.
"Buffalo," New York.
14 crts. Sewing Machines.
31 pkgs. Pipe Castings.
10 cs. Pumping Machinery.
31 pkgs. Machinery.
144 pkgs. Hardware.
14 pkgs. Cycles.
60 pkgs. Agricultural Implements.
27 pkgs. Steel.
50 pkgs. Woodware.
28 cs. Handles.

October 22.
LIVERPOOL.
"Westernland," Philadelphia.
4 bxs. 46 cs. Handles.
12 cs. Machinery.
13 bxs. Hardware.
"Bohemian," New York.
80 pkgs. Machinery.
9 cs. Tinware.
769 pkgs. Handles.
47 rls. Copper Wire.
39 pkgs. Woodware.
11 crates Wheels.
62 cs. Hardware.
21 crts. Spokes.
6 pkgs. Scales.
28 cs. Lamp Burners.
106 pkgs. Iron Pipe.
17 bbls. Skewers.
40 bbls. Plain Wire.

October 21.
MANCHESTER.
"Chaucer," New York.
431,550 lbs. Wshd. Metal.
14,111 pigs Lead.
2293 bars Copper.
269 pkgs. Machinery.
17 crts. Wheels.
36 cs. Hardware.
50 cs. Handles.
24 cs. Nuts and Bolts.
3 cs. Motors.
13 cs. Copper Material.
29 pkgs. Hardware, Woodware, &c.
27 pkgs. Elect. Material.
10 pkgs. Tool Machinery.
143 pcs. Steel.
50 pkgs. Elect. Machinery.
1324 bgs. Wire Nails.
40 bbls. Plain Wire.
34 bxs. Steel Shafting.
6 cs. Files.

October 24.
LONDON.
"Bostonian," Boston.
477 pkgs. Hardware, Wooden ware, &c.
35 pkgs. Machinery.
50 pkgs. Tools.
103 pkgs. Sewing Machines.

October 23.
LIVERPOOL.
"Teutonic," New York.
224 pkgs. Machinery.
12 cs. Firearms.
210 pkgs. Hardware.
20 pkgs. Agric. Implements.
395 cs. Copper Rods.
"Sachem," Boston.
57 pkgs. Machinery.
1053 bdls. Wire.

October 27.
LONDON.
"Menominee," New York.
20 pkgs. Iron Castings.
166 bbls. Skewers.
18 cs. Tools.
13 pkgs. Machinery.
50 cs. Oil Stoves.
2224 bdls. Hoops.
33 pkgs. Wheels.
12 cs. Separators.
24 bdls. Rims.
70 cs. Cash Registers.
37 pkgs. Hardware.

October 25.
LIVERPOOL.
"Merion," Boston.
94 pkgs. Machinery, &c.
23 pkgs. Hardware, &c.
7 cs. Damper Regulators.
"Nomadic," New York.
12 cs. Elect. Goods.
10 pkgs. Lamp Goods.
121 pkgs. Machinery.
14 kgs. Nails.
34 bxs. Car Material.
3 cs. Bicycles.
10 crts. Spokes.
37 pkgs. Tinware.
1668 bars Copper.
6029 pigs Lead.
40 cs. Wringers.
9 crts. Wood Pulleys.
"Indore," Baltimore.
36 crts. Handles.

October 24.
BRISTOL.
"Jersey City," New York.
296 bgs. Nails.
27 cs. Spokes.
72 bbls. Skewers.
42 cs. Hardware.
15 pkgs. Castings.
1947 pkgs. Lead.

October 28.
LONDON.
"Minnetonka," New York.
5 trcs. Casings.
68 cs. Cartridges.
397 pcs. and bdls. Iron Pipes.
70 pkgs. Rifles.
689 pkgs. Radiators.
73 pkgs. Wire.
159 pkgs. Typewriters.
24 cs. Cash Registers.
87 pkgs. Cycles.
137 pkgs. Elect. Goods.
22 cs. Cutlery.
80 cs. Wringers.
146 pkgs. Wheels and Hubs.
212 pkgs. Machinery.

October 27.
LIVERPOOL.
"Umbria," New York.
117 pkgs. Hardware.
125 cs. Engine Governors and parts.
44 pkgs. Wood Pulleys.
17 crts. Wheels.
132 pkgs. Sewing Machines.
11 pkgs. Hardware, &c.
208 bdls. Handles.
284 cls. Copper Rods.
166 pkgs. Radiators.
24 cs. Washing Machines.
37 cs. Wire.

"Ivernia," Boston.
60 bbls. Wire.
67 cs. Nails.
"Cymric," New York.
14 pkgs. Machinery.
40 cs. Tinware.
15 crts. Bicycles.
38 cs. Machinery.
12 crts. Wheels.
12 crts. Handles.
4822 pigs Lead.
867 pcs. Iron Pipe.

October 25.
HULL.
"Consuelo," New York.
319 pkgs. Hardware.
94 pkgs. Castings.
30 cs. Iron Ware.
13 cs. Handles.
67 cks. Nickel.
11 bxs. Copper.
17 rolls 1 bdl. Wire.
56 cs. Nails.
80 bxs. Sewing Machines and parts.
56 pkgs. Machinery.
From Boston.
142 pkgs. Machinery.
100 pkgs. Handles.

October 29.
"Oceanic," New York.
366 cs. Hardware.
279 pkgs. Machinery.
112 cs. Woodware.
394 coils Copper Rods.
12 pkgs. Bicycles.
16 cs. Steel.
25 pcs. Castings, &c.

October 31.
"Cambrian," Boston.
40 pkgs. Radiators.
30 pkgs. Pump Machinery.
250 bdls. Handles.
38 pkgs. Iron Chain.
35 pkgs. Steam Appliances.
"East Point," Philadelphia.
80 bbls. Wire.
40 pkgs. Nails.
340 pkgs. Nails.
103 pkgs. Wheels.
19 pkgs. Pipe, &c.
82 pkgs. Hardware.
120 pkgs. Wheelbarrows.
215 pkgs. Handles.
498 pkgs. Nails.
436 cs. Choppers.

October 30.
LIVERPOOL.
"Belgenland," Philadelphia.
16 cs. Machinery.
851 bgs. Petrol Coke.
"New England," Boston.
237 pkgs. Machinery.
12 pkgs. Wind Mills.
21 cs. Screws.
25 bbls. Casings.
1100 Pails.
"Kansas," Boston.
43 pkgs. Machinery.
48 bxs. 3 cs. Iron.
110 Radiators.
87 cs. Spokes.

October 31.
SOUTHAMPTON.
"St. Louis," New York.
1424 pkgs. Hardware.
94 pkgs. Typewriters.
61 pkgs. Machinery.
HULL.
"Martello," New York.
112 cks. Nickel.
8 pkgs. Typewriters.
15 pkgs. Agric. Implements.
54 pkgs. Machinery.
640 bdls. 500 pcs. Iron Pipe.
108 pkgs. Handles.
186 Hand Spikes.
109 bars 1 bx. Iron.
52 pkgs. Radiators and parts.

October 30.
BRISTOL.
"Chicago City," New York.
520 bgs. Nails.
60 bbls. Wire.
51 bxs. Nails.
27 pkgs. Castings.
65 pkgs. Spokes, Hubs and Rims.
18 cs. Lampware.
10 cs. Hardware.
8 cs. Blowers and parts.
67 pkgs. Machinery.
8 cs. Spokes.
22 cs. Handles.

November 1.
LIVERPOOL.
"Lucania," New York.
64 pkgs. Machinery.
34 crts. Wheels.
19 pkgs. Ironware.

The South African Shipping Trade War.

The South African freight war still continues to attract great attention over here, and no one can foresee the ultimate outcome. A peculiar feature of it is that the fight is taking place without the conference companies indulging in cut freights. The situation is roughly this: The conference lines continue their settled rates of freight, in spite of the fact that Houston & Co. are charging rates some 50 per cent. less. The shippers and their agents form the field of battle, and, while Houstons try to win them over, the conference uses great efforts to retain them within the ring. The "vile body" of the shipper is, indeed, in some danger of being pulled in pieces. If from a desire to pay low rates he goes to Houston & Co. with some of his goods, the conference takes it out of the goods which he may be obliged to send by one of their boats, and as the conference dispatches some six or eight vessels for every one which Houston & Co. send, there are many opportunities of exercising moral suasion. It is asserted that in some cases the goods of Houston & Co.'s customers have been actually boycotted by the conference; but it appears to be the more general practice to charge additional freight rates upon the cargo which must be sent by these "blackleg" shippers in the conference steamers.

An unfortunate feature of the struggle is the bitter feeling which has been generated on both sides. Each side suspects the other of improper methods, and the ill feeling which has resulted has a good deal to do with the severity with which the battle is being fought.

The main facts as to the competition are simple. Houston & Co. run two cargo boats every month from London and two from Liverpool and Glasgow, making a weekly service from the United Kingdom to South African ports. These boats return home by way of South America, and thus complete a circular voyage. As there are practically no homeward freights from South Africa, except gold and such cargo as the mail boats carry, it is necessary to make a circular voyage in order to avoid running in ballast. Some of the cargo boats of the conference lines make, on a similar principle, circular voyages to the East. Under the present conditions in South Africa there is a very large amount of cargo going from the United Kingdom, and shippers complain that their shipments are often seriously delayed through want of facilities. Even if Houstons filled up their weekly boats to the hatches they could not carry one-tenth of the cargo which has to go out to South African ports. The competition with the conference is, therefore, only partial, and under present conditions is not very material.

The conference lines would like to retain all this trade, as well as all future trade, in their own hands and charge what they consider remunerative rates; but at the same time most people will rather welcome a little healthy competition. Freight rates in other trades have had to come down to meet the conditions generally prevailing, and it can hardly be claimed for the conference lines that they are entitled to a monopoly of the one branch of the shipping trade which remains prosperous. It is perhaps natural that the conference lines should do their best to stamp upon any competitor, but there are limits to what is justifiable in commercial warfare. The conference's hold upon its customers is maintained through a system of deferred rebates—rebates upon freight rates which are not paid until 15 months after shipment—and shippers are kept tied by the fear of losing the rebates which have been earned but not yet paid. Whether accrued rebates can be withheld from shippers who desert the conference is, I understand, not yet legally determined, and will probably form the subject of litigation.

The battle is going on on both sides of the Atlantic. Houstons, in conjunction with the Prince Line, run a fortnightly service of cargo steamers from New York to South Africa, and they compete with those boats of the conference lines which are in the New York-South Africa trade. At first the conference fought by the old methods of rate-cutting, but this system has been given up, and there is now much the same difference between the conference freights and those of Houstons in New York as there is here.

EXPORTS TO THE RIVER PLATE.

LATE advices indicate favorable commercial conditions in the River Plate countries—*i. e.*, Argentina and Uruguay, and, so far as our merchants are concerned, more specifically the ports of Montevideo, Buenos Aires and Rosario, from whence imports are in the main distributed to the interior. Both countries have been on a gold basis for something like five years, and we are informed, have no political troubles in sight. In Argentina there are prospects of a large wheat and corn crop, two of the principal staples they produce; in Uruguay a very fair wheat crop is anticipated, and as their seasons are exactly opposite to ours the crops are far enough along to afford some basis for estimate. General business in both countries is fine, there being especially good orders coming in for Agricultural Implements, that play an important part in developing cereal producing countries, the merchandise of this character now going forward in larger volume than last year. Large quantities of case oil (kerosene) and lumber continue to be an important export from the United States, and there is a good general demand for manufactured merchandise. There are now four lines of steamers between New York and River Plate ports, with sailings approximately every Saturday, where a few years ago exports from the United States were carried in sailing vessels. Moreover, the steamers have been crowded with freight all summer and fall.

Samuel Shirk & Sons, Hanover, Pa., are about to take possession of what is practically a new establishment, the inside of the old building having been entirely remodeled and a large addition built on the rear, the entire lot thus being covered. The front of the first floor was torn out and replaced by a modern front with two large display windows. The front structure is 32 x 85 feet in dimensions and the rear building 32 x 145 feet. The company are both wholesalers and retailers, and the business is one of the oldest in Hanover, dating back at least 80 years.

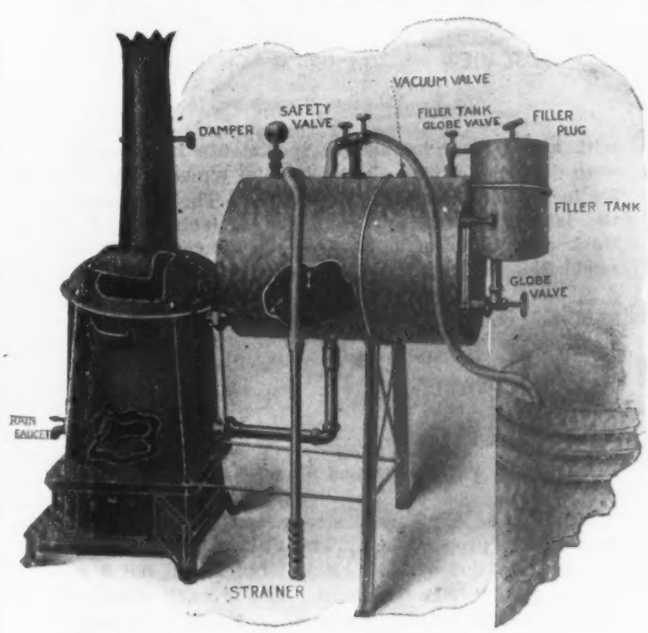
New Carpet Sweeper Handle.

The National Sweeper Company, Marion, Ind., have designed a new handle for carpet sweepers of their manufacture, as shown herewith. A steel ferrule is the essential feature of the improvement, giving protection against worn out or broken threads. The ferrule, which is glued and riveted to the handle, is made to fit the sweeper bail snugly to make a rigid connection and to reduce the liability to loosen.

New Carpet Sweeper Handle.

Rippley's Improved Feed Cooker, Water Heater and Steam Generator.

The Rippley Hardware Company, Grafton, Ill., are offering the improved 1902 feed cooker, water heater and steam generator, shown in the accompanying cut. The fire box is a double cylinder, made of No. 12 steel, which is surrounded at all times by water, to cause a rapid circulation of water between the fire box and steam chest. The fire box is referred to as being so constructed that all the heat is utilized. It has a heavy cast iron top, and cast airtight base, provided with a deep ash pit, and a pull-out center shake grate. The fire box is constructed so as to hold fire over night, and wood, coal or coke may be used as fuel. The steam chest is made of galvanized steel, rests on an iron frame of 1¼-inch channel iron, and is fitted with a safety valve, water gauge, and the company's filler tank, which is designed to allow the cooker to be filled with water without allowing steam to go down. The cooker is for the use of farmers and breeders, to cook feed and to heat hog, poultry or brooding houses. At the same time, it is remarked that the cooker will heat water in stock tanks at a distance of 300 feet; also that it may be used for heating dairy buildings, steaming cans, cooking paste and heating hothouses. The cooker can be used outside, or attached to any chimney. Two sizes are made—numbers 16 and 20—the numbers indicating the diameter in inches of the fire boxes.



Rippley's Improved Feed Cooker, Water Heater and Steam Generator.

Electric Railroad No. 1.

Knapp Electric & Novelty Company, 511-513 Fifty-first street, New York, are putting on the market the electric railroad shown in the accompanying cuts. The car shown in Fig. 1 is 8 inches long, 5 inches high and is painted in three colors, with gilt lettering. The motor is placed under the cars the same as large ones. It is self starting and is geared direct to the truck. The track, with cross ties, is 9 feet in circumference, and the outfit is furnished complete with a Kenco cell, Fig. 3, that will drive the car about three hours before recharging. Material for four charges is furnished with the outfit. By using one additional cell an increased speed may be obtained. Dry cells, storage or primary cells of a good type may be used in place of the battery furnished, if desired. Additional track in 9 feet lengths, connectors, switches, crossings, &c., with which any desired shape or length can be made, can be obtained of the company.

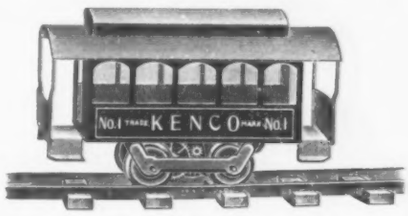


Fig. 1.—Electric Railroad No. 1.

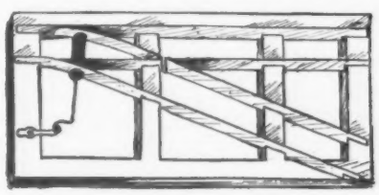


Fig. 2.—Electric Railroad Switch.

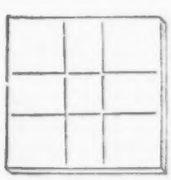


Fig. 3.—Crossing.

Battery No. 1.

Lyons Mason Fruit Jar Wrench.

Lyons Specialty Company, Lyons, Iowa, are offering the Mason's fruit jar wrench, shown herewith. It is designed to close and open fruit jars, and can also be used as a lifter to handle jars when they are hot.

Lyons Mason Fruit Jar Wrench.

Ford's Patent Clark Expansive Bit.

Peck, Stow & Wilcox Company, Southington, Conn., and 27 Murray street, New York, have just brought out Ford's patent Clark expansive bit, here shown. Fig. 1

Fig. 1.—Clark Expansive Bit, Ford's Patent.

illustrates the bit ready for use, Fig. 2 being an enlarged outline view of the working parts, indicating the method by which the cutter is prevented from slipping in use, even when farthest extended. The large screw fastens the cutter as in the original Clark and other expansive bits, a slight turn of the small screw against the rear end of the clamp greatly increasing the pressure of the clamp against the cutter. The peculiar construction of the clamp provides a lever having its fulcrum at the center of the large screw, the power being applied at the end of the lever by the smaller screw. The bits are forged from Jessop's best tool steel, each carefully tested and packed singly in double pasteboard boxes, the small size having a cutter boring from ½ to ⅞ inch and a large cutter, with a capacity of ⅞ to 1½ inches, inclusive. A large size is also made, having one cutter with a capacity of ⅞ to 1¾ inches, and a large cutter boring 1¾ to 3 inches, inclusive. Each bit is warranted perfect by the company.

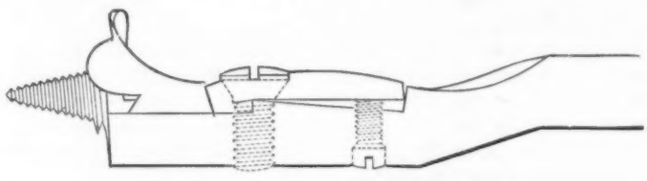


Fig. 2.—Outline View of Working Parts.

Lenox Atomizer and Sprinkler.

The Lenox Mfg. Company, Pittsfield, Mass., New York office 110 Chambers street, have recently put on the market an improved form of the Lenox atomizer and sprinkler, as here illustrated. It is designed particularly for minutely spraying plants, flowers, &c., indoors and out of doors, but can as easily be used for dampening

Lenox Atomizer and Sprinkler.

clothes, disinfecting or deodorizing a sick room, by using a suitable solution, without injuriously wetting carpets or walls from an excess of moisture. The device consists of a metallic frame, japanned, 7¼ inches long over all, the inner diameter of ring being 1¾ inches, in which rests a removable rubber bulb 2¼ inches outside diameter, having a circular opening at the top of ⅜ inch and at the bottom 144 needlelike perforations that only permit fine jets of spray to pass through under pressure, a black enameled wood turning of suitable shape emptying the bulb when the handles are pressed. The bulb is filled by compressing the handles with the bulb under water, when relaxing the pressure causes the vacuum to be quickly filled through the upper opening, which is covered when the water or solution is sprayed. One advantage of this sprayer is that insects can be easily reached underneath the foliage with an insecticide by a gentle pressure, or by vigorously closing the handles to throw a fine mist 10 feet in the air. With a moderate amount of water in a receptacle spraying can be quickly and easily done by dipping the bulb in the water as often as needed. The spray complete weighs but 6½ ounces and is put up singly in pasteboard boxes.

New Mossberg Wrenches.

The accompanying illustrations represent new wrenches put on the market by the Frank Mossberg Company, Attleboro, Mass. Wrench No. 15, Fig. 1, is designed for all kinds of bicycle work, and is provided

Fig. 1.—Alderman Wrench No. 15.

with a tire lever handle for special use in connection with detachable tires. The Diamond wrench, Fig. 2, is 5½ inches long, weighing 5¾ ounces. The thickness of the jaw is ¼ inch, and it opens 1⅝ inches. It is of thicker stock and of larger size than the company's Diamond No. 10, and is capable of heavier work. It is

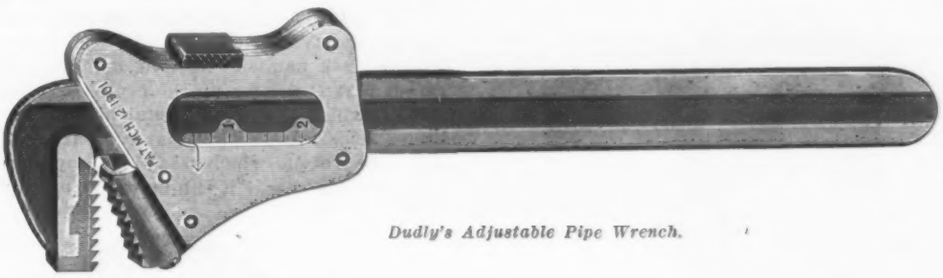
Fig. 2.—Diamond Wrench No. 11.

referred to as being very strong, well constructed and handsomely proportioned. The Falcon wrench, Fig. 3, is a modification of their Eagle wrench, but not a substitute for it, it is remarked. The wrench illustrated is flat, the jaws being designed to adapt it to certain lines of work, difficult or impossible of accomplishment by other forms of wrenches. It is referred to as a desirable tool for general mechanical purposes, being equally applicable to pipe, bolt or nut. All of these wrenches are furnished case hardened and nickel plated, or case hardened without nickel, if desired.

Fig. 3.—Falcon Pipe Wrench No. 25.

Dudly's Adjustable Pipe Wrench.

In the adjustable pipe wrench shown herewith strong rack teeth on the slide part engage with teeth on the front edge of the stock. An eccentric lever locks the wrench positively, it is explained, so that no adjusting part is under strain when the wrench is in use. It is stated that at the point where the heaviest strain is applied to the wrench the greatest strength is embodied, that the wrench has no lost motion, that it grips



Dudly's Adjustable Pipe Wrench.

the object instantly and that the slightest back action releases the grip. A graduated scale is provided for adjusting the wrench in a second for any size of pipe from ½-inch to 2 inches. The lower jaw is movable and slides upward to the narrow part of the jaw opening, working like a wedge to secure a firm grip on the object. A coil spring located in a channel brings the jaw block back again to its normal position. The wrench is put on the market by the A. Dudly Mfg. Company, Menominee, Mich.

Birch's Combined Fence Builder and Staple Puller.

The Birch Mfg. Company, Granite City, Ill., are offering the combined wire stretcher, fence builder and staple puller shown herewith. This is a casting measuring 3 inches in width and 4½ inches in length over all, weighing less than ¾ of a pound. In use a lever about 4 feet long is inserted in the ring, when the wire to be stretched is attached by dropping the slot on either side over the wire. By putting the end of the lever on the

Birch's Combined Fence Builder and Staple Puller.

side of the post the wire can be drawn across the face of the post. The operator by placing his back against the other end of the lever releases both hands, one to use a hammer and the other to hold a staple, with which the wire is secured in place. Staples are drawn by using the claws at the top of the device. Among the points of excellence the following are mentioned: That with the stretcher one man can do the work where two are usually necessary with other wire stretchers; that the stretcher can be used at every post, or at every five, ten or 20 posts; that a wire can be stretched and slacked to the post that is braced; that old fences can be easily repaired by drawing up the wire between each post and kinking it a little with the stretcher; that every staple can be pulled out of posts when rebuilding a fence and the staples preserved for further use, and that the stretcher is comparatively cheap.

The Tip Top Rural Mail Box.

The rural mail box, illustrated herewith, is made of heavy gauge galvanized iron, well constructed. It is entirely devoid of springs, triggers and other automatic devices. It is referred to as combining the best features of the top opening box to insure easy inspection, and of the end opening box, which facilitates collection of outgoing mail by the carrier. It is practically two boxes in one without an opening of any kind communicating with the inner box, to insure protection to the contents

Fig. 1.—The Tip-Top Rural Mail Box.

from rains, blizzards or sand storms. The manufacturers state that the box complies with Post Office Department specifications and has been inspected and approved by the Department, also that it is durable, effi-

Fig. 2.—Rural Mail Box Partially Open.

cient and economical. The box is furnished in four styles: Box only, galvanized; box with carrier signal, galvanized; box only, aluminum finish, and box with carrier signal, aluminum finish. Padlocks are furnished if desired. The boxes are put on the market by the American Mail Box Company, Hillsboro, Ill.

Improved Hose Coupling.

In Fig. 1 of the accompanying illustrations is shown an improved hose coupling, while in Fig. 2 a sectional view of the coupling is given. It is shown by Fig. 2 that the hose is secured by the pressure of the tapered portion of part 3, which is screwed into part 4 by means of the square socket at the larger end. There are several slight depressions in the walls of part 4, into

Fig. 1.—Improved Hose Coupling.

which the pliable hose imbeds itself, to make it impossible to withdraw the hose until uncoupled. A rubber gasket is used between the faces of parts 1 and 3. In making connections with the coupling, part 1 having a female end, may be attached directly to the pipe line without the expense of a pipe coupling. The object of this form of coupling is to solve the problem of connecting power hose to pressure mains, and also to prevent

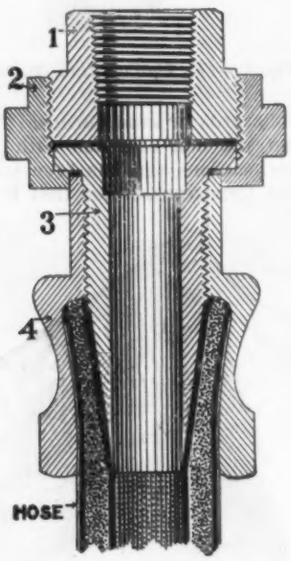
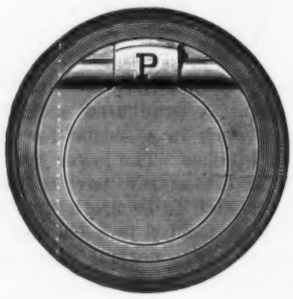


Fig. 2.—Sectional View of Hose Coupling.

leaking by the introduction of a new method by which the hose is held by the coupling securely compressed in a metal pocket without the use of outside clamps. Another prominent feature is the increased size of the air passage, which, it is stated, is not possible where the hose is drawn over the corrugated end of the coupling. The substantial proportions of the coupling and the absence of projecting bolts are referred to as prolonging the life of the coupling. The couplings are manufactured in malleable iron and brass by the American Engineering Works, 204 Dearborn street, Chicago, Ill.

Chesterman's Flush Handle for Measuring Tapes.

James Chesterman &. Co., Sheffield, England, manufacturers of various kinds of measuring tapes, have just brought out Chesterman's patent flush handle, as here illustrated, in connection with their wind up measuring tapes, which is regularly supplied with their steel tapes, but can be furnished with any Chesterman tapes that have a flush handle. As now made a pressure on the raised part P throws up the center disk, on the reverse side of which is a small metal handle for winding the tape. This construction is a great improvement on the former style, which was raised by using the thumb nail. As now made it can be easily operated even with

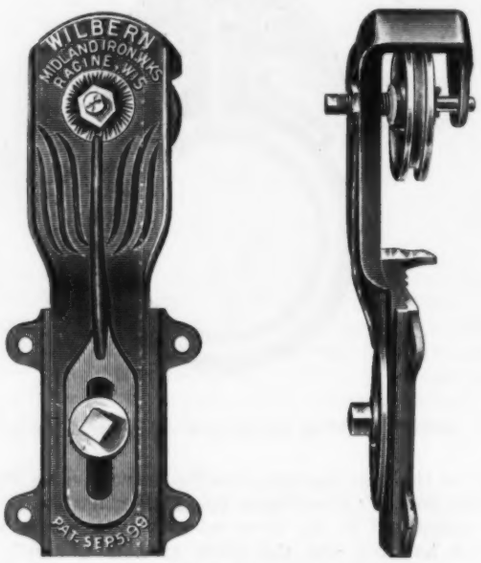


Flush Handle for Wind Up Measuring Tapes.

thick gloves on. Their steel tapes are made in lengths of 25, 33, 40, 50, 66, 75 and 100 feet, graduated in tenths and twelfths of a foot. The cases are of leather, brass mounted.

No. 2 Special Wilbern Door Hanger.

The Midland Iron Works, Racine, Wis., are putting on the market a new design of their Wilbern hanger, which is intended for heavy factory and warehouse doors, shown in the accompanying cuts. It is 16½ inches long, 4½ inches wide above the offset and 3 inches below. There are three strong ribs to strengthen the



No. 2 Special Wilbern Door Hanger.

hanger where the lateral strain is greatest. It has both vertical and lateral adjustment. The adjustments are secured by means of a threaded axle and a plate and ratchet. The sheave is made of malleable iron, as is also the rest of the hanger, and the bearings are hardened steel rollers. The hanger is adapted to track 2½ x ⅜ inch.